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Journal of the Asiatic
Society of Bengal







JOURNAL
OF THE
ASIATIC SOCIETY
OF
✓
BENGAL.

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VOL. XI.

PART II. JULY TO DECEMBER, 1842.

NEW SERIES.

“ It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia* will commit their observations to writing, and send them to the Asiatic Society in Calcutta ; it wil languish, if such communications shall be long intermitted ; and will die away, if they shall entirely cease.”—SIR WM. JONES.

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CONTENTS.

PART II.

No. 127.

| | <i>Page.</i> |
|---|--------------|
| I.—A Sixth Memoir on the Law of Storms in India, being Storms in the China Seas, from 1780 to 1841. By Henry Piddington, Esq. | 605 |
| II.—Observations on the Herat Astrolabe, described in No. 118, of the Journal. By the Rev. J. S. Pratt, Chaplain to the Right Rev. the Lord Bishop of Calcutta. | 720 |

No. 128.

| | |
|--|-----|
| I.—A description of the Coal Field of the Damoodah Valley and the adjacent Countries of Beerhoom and Poorooleah, as applicable to the present date, 1842. By J. Homfray, Esq. | 728 |
| II.—A Monograph of the species of Lynx. By Edward Blyth, Curator to the Asiatic Society. | 740 |
| III.—Selections communicated by the Sudder Board of Revenue at Allahabad, from Correspondence respecting the proposed formation of a Canal for Irrigation to be supplied from the River Jumna, near the Village of Kuttha Puthur, in the Deyra Doon. From Capt. P. T. Cautley, to the Secretary of the Sudder Board of Revenue, North Western Provinces, | 761 |
| IV.—Comparison of the Areas of Plane and Spherical Triangles. By Capt. Shortrede, 1st Assistant, Grand Trigonometrical Survey... .. . | 779 |
| V.—A Note on Capt. Shortrede's Remarks in No. CXXIII, (Page 240) of this Journal. By S. G. T. Heatly Esq. | 782 |
| VI.—Descriptive Notice of the Bat described as <i>Taphozous longimanus</i> by Gen. Hardwicke. By Edward Blyth, Curator to the Asiatic Society. | 784 |
| VII.—Proceedings of the Asiatic Society. | 786 |

No. 129.

| | |
|---|-----|
| I.—Contributions towards a History of the development of the Mineral Resources of India. By S. G. Tollemache Heatly, Esq. | 811 |
| II.—Memorandum on the usual Building Materials of the district of Cuttack, forwarded to the Museum of Economic Geology, with a set of specimens. By Lieut. Rigny, Executive Engineer, Cuttack Division. | 839 |
| III.—Second Report on the Tin of Mergui. By Capt. G. B. Tremenhede, F. R. S. Executive Engineer, Tenasserim Division. | 839 |
| IV.—Notes on the Iron of the Kasia Hills, for the Museum of Economic Geology. By Lieut. Yule, Engineers. | 853 |

| | <i>Page.</i> |
|--|--------------|
| V.—Captain Thos. Hutton on <i>Galeodes (vorax?)</i> | 857 |
| VI.—Proceedings of the Asiatic Society for August. | 863 |
| VII.—Proceedings of the Asiatic Society for September. | 876 |

No. 130.

| | |
|--|-----|
| I.—A Monograph of the Indian and Malayan species of Cuculidæ, or Birds of the Cuckoo family. By Edward Blyth, Curator of the Asiatic Society. .. | 897 |
| II.—Notes, principally Geological, on the Tract between Bellary and Bijapore. By Capt. Newbold, F. R. S. &c. Madras Army. | 929 |
| III.—Notes, principally Geological, from Bijapore to Bellary, via Kannighirri. By Capt. Newbold, F. R. S. &c. Madras Army. | 941 |
| IV.—Ancient Inscription found at Aden, Communicated to the Asiatic Society by the Government of India. With a plate. | 958 |
| V.—Meteors observed at Allahabad on the 10th of August, 1842. By Capt. Shortrede, 1st Assistant, Grand Trigonometrical Survey of India. .. | 959 |
| VI.—Memorandum on the “Bora Chung,” of Bootan. By A. Campbell, Esq., Superintendent, Darjeeling, | 963 |
| VII.—Proceedings of the Asiatic Society for October. | 964 |

No. 131.

| | |
|---|------|
| I.—A Seventh Memoir on the Law of Storms in India; being the Calcutta Hurricane of 3rd and 4th June 1842. By Henry Piddington, Esq. | 971 |
| II.—A Monograph of the Indian and Malayan species of Cuculidæ, or Birds of the Cuckoo family. By Edward Blyth, Curator of the Asiatic Society.— (Concluded.) | 1095 |
| III.—The Avatars of Vishnoo. An abstract Translation from the Pudma Pooran. By E. C. Ravenshaw, Esq. | 1112 |

No. 132.

| | |
|--|------|
| I.—Specimens offered to the Asiatic Society of Bengal. By Captain Newbold, F. R. S. &c. Madras Army, | 1131 |
| II.—Report on a Route from Pakung Yeh in Ava, to Aeng in Arracan. By Lieut. Trant, of the Q. M. G. Dept., | 1136 |
| III.—Capt. Manson’s Journal of a Visit to Melum and the Oonta Dhooora Pass in Juwahir. Edited by J. H. Batten, Esq. C. S. for the Journal of the Asiatic Society. | 1157 |
| IV.—On the Wool of the Bactrian, or two-humped Camel (<i>Camelus Bactrianus</i>), being a Copy of an unpublished paper forwarded to the Royal Asiatic Society of London. By Captain Thomas Hutton, | 1182 |
| V.—Public Papers relating to the Nurma or Chanderi Cotton, in reference to queries by Mr. Piddington, Journal Asiatic Society Vol. X. p. 715; being a report to Government by Capt. J. Abbott, Assistant Resident Nimaur. | 1188 |
| VI.—Proceedings of the Asiatic Society for November. | 1198 |
| VII.—Proceedings of the Asiatic Society for December... .. . | 1204 |

INDEX TO PART II.

| <i>Page.</i> | <i>Page.</i> |
|--|---|
| <p>Ancient Inscription found at Aden. Communicated to the Asiatic Society by the Government of India. With a plate. By Capt. Haines, . . . 958</p> <p>Areas of Plane and Spherical Triangles. Comparison of the. By Capt. Shortrede, 776</p> <p>Avatar of Vishnoo. An abstract Translation of the, from the Pudma Pooran. By E. C. Ravenshaw Esq. 1112</p> <p>Bat described as <i>Tapozous longimanus</i>, by Gen. Hardwicke. Descriptive Notice of. By Ed. Blyth, 784</p> <p>Bijapore to Bellary, via Kannighirri Notes principally Geological, from. By Capt. Newbold, F. R. S. &c. . 941</p> <p>Bora Chung, of Bootan. Memorandum on the. By A. Campbell, Esq. 963</p> <p>Building Materials of the district of Cuttack. Memorandum on, forwarded to the Museum of Economic Geology, with a set of specimens. By Lieut. Rigby, 836</p> <p>Canal for Irrigation. Selections communicated by the Sudder Board of Revenue at Allahabad, from Correspondence respecting the proposed formation of a, from the river Jumna, near the Village of Kuttha Putthur, in the Deyra Doon. From Capt. P. T. Cautley, . 761</p> <p>Coal Field of the Damoodah Valley. A description of the, and the adjacent countries of Beerbhoom and Poorooleah, as applicable to the present date 1842. By J. Homfray, Esq. 723</p> <p>Galeodes (vorax ?) Capt. T. Hutton, on, 857</p> <p>Herat Astrolabe. Observations on the, described in No. 118, of the Journal. By Rev. J. S. Pratt, . . 720</p> <p>History of the development of the Mineral Resources of India. Contributions towards. By S. G. Tollemache Heatly, Esq. 811</p> <p>Indian and Malayan species of <i>Cu-</i></p> | <p><i>culidæ</i>. A Monograph of the, or Birds of the Cuckoo family. By Edward Blyth, 897-1095</p> <p>Iron of the Kasia Hills. Notes on the, for the Museum of Economic Geology. By Lieut. Yule, 853</p> <p>Law of Storms in India. A Sixth Memoir on the, being Storms in the China Seas, from 1780 to 1841. By H. Piddington, Esq. 605</p> <p>Law of Storms in India. A Seventh Memoir on the, being the Calcutta Hurricane of 3rd and 4th June 1842. By Henry Piddington, Esq. 971</p> <p>Meteors observed at Allahabad on the 10th of August, 1842. By Capt. Shortrede, 951</p> <p>Note on Capt. Shortrede's Remarks in No. CXXIII, (page 240) of this Journal. By S. G. T. Heatly, Esq. 782</p> <p>Nurma or Chanderi Cotton in reference to queries by Mr. Piddington, By Capt. Abbott, Journal Asiatic Society Vol. X. p. 716, 1188</p> <p>Proceedings of the Asiatic Society, 786, 863, 876, 964, 1198, 1204</p> <p>Route from Pakung Yeh in Ava to Aeng in Arracan. Report on a. By Lieut. Trant, 1136</p> <p>Species of <i>Lynx</i>, a Monograph of the. By Edward Blyth 740</p> <p>Specimens offered to the Asiatic Society of Bengal. By Capt. Newbold, F. R. S. 1131</p> <p>Tin of Mergui, Second Report on the. By Capt. G. B. Tremenheere. 839</p> <p>Tract between Bellary and Bijapore. Notes, principally Geological, on the. By Capt. Newbold, F. R. S. &c. 929</p> <p>Visit to Melum and the Oonta Dhoora Pass in Juwahir, Edited by J. H. Batten, Esq. C. S. Journal of a. By Capt. Manson, 1157</p> <p>Wool of the Bactrian, or two humped Camels, (<i>Camelus Bactrianus</i>). By Capt. Thomas Hutton, 1182</p> |

INDEX TO NAMES OF AUTHORS.

PART II.

| | <i>Page.</i> | | <i>Page.</i> |
|---|--------------------------------|--|--------------|
| ABBOTT, Capt. Nurma or Chanderi Cotton, in reference to queries by Mr. PIDDINGTON, Journal Asiatic Society Vol. X. p. 716, .. | 1183 | MANSON, Capt. Visit to Melum and the Oonta Dhoora Pass in Juwahir, Edited by J. H. BATTEN, Esq. C. S. Journal of a. | 1157 |
| ASIATIC SOCIETY, Proceedings of the, | 786, 863, 876, 964, 1198, 1204 | NEWBOLD, Capt. F. R. S. &c. Tract between Bellary and Bijapore. Notes, principally Geological, on the, | 929 |
| BLYTH, EDWARD. Species of Lynx, a Monograph of the. | 740 | Bijapore to Bellary, via Kannighirri. Notes principally Geological, from. | 941 |
| Bat described as | | Specimens offered to the Asiatic Society of Bengal. | 1131 |
| Taphozous longimanus, by Gen. HARDWICKE. Descriptive Notice of, | 784 | PIDDINGTON, H. Esq. Law of Storms in India. A Sixth Memoir on the, being Storms in the China Seas, from. 1780 to 1841. | 605 |
| Indian and Malayan species of Cnuculidæ. A Monograph of the, or Birds of the Cuckoo family. | 897-1095 | Law of Storms in India. A Seventh Memoir on the, being the Calcutta Hurricane of 3rd and 4th June 1842..... | 971 |
| CAMPBELL, A. Esq. Bora Chung, of Bootan. Memorandum on the. | 963 | PRATT, REV. J. S. Herat Astrolabe. Observations on the, described in No. 118, of the Journal..... | 720 |
| CAUTLEY, P. T. Capt. Canal for Irrigation. Selections communicated by the Sudder Board of Revenue at Allahabad, from Correspondence respecting the proposed formation of a, from the river Jumna, near the Village of Kuttha Putthur, in the Deyra Doon. | 761 | RAVENSHAW, E. C. Esq. Avatar of Vishnoo. An abstract Translation of the, from the Pudma Pooran..... | 1112 |
| HAINES, Capt. Ancient Inscription found at Aden. Communicated to the Asiatic Society by the Government of India. With a plate,.... | 958 | RIGBY, Lieut. Building Materials of the district of Cuttack. Memorandum on, forwarded to the Museum of Economic Geology, with a set of specimens. | 836 |
| HEATLY, S. G. T. Esq. A Note on Capt. SHORTEDE's Remarks in No. CXXIII, (Page 240) of this Journal. | 782 | SHORTEDE, Capt. Areas of Plane and Spherical Triangles. Comparison of the. | 776 |
| History of the development of the Mineral Resources of India. Contributions towards a, | 811 | Meteors observed at Allahabad on the 10th of August, 1842..... | 951 |
| HOMFRAY, J. Esq. Coal Field of the Damoodah Valley. A description of the, and the adjacent countries of Beerbhoom and Pooroolah, as applicable to the present date 1842. | 723 | TRANT, Lieut. Route from Pakung Yeh in Ava, to Aeng in Arracan. Report on a, | 1136 |
| HUTTON, THOS. Captain. On Galeodes (vorax?) | 857 | TREMENHEERE, G. B. Capt. Tin of Mergui, Second Report on the. | 839 |
| Wool of the Bactrian, or two humped Camel, (Camelus Bactrianus.) .. | 1182 | YULE, Lieut. Iron of the Kasia Hills. Notes on the, for the Museum of Economic Geology. | 853 |



JOURNAL
OF THE
ASIATIC SOCIETY.

Specimens offered to the Asiatic Society of Bengal. By Captain
NEWBOLD, F. R. S. &c., Madras Army.*

EGYPT.

- No. 1. Crystallized gypsum, from the desert of Benihassan; occurs in thin layers and seams in the marls and loose sandstones immediately below the gravel and sands composing the surface. It is also found in the nummulitic limestone, and generally associated with muriate of soda.
2. Egyptian pebble, (variety of jasper), among the rolled pebbles of quartz, chert, flinty slate, limestone, intermingled with a few of the plutonic and hypogene rocks, that constitute the gravel of the Egyptian desert.
3. Silicified wood, from the fossil forest near Cairo. Specimens which I took thence to England were kindly examined for me by Mr. Robert Brown, who pronounced all those, the characters of which were distinguishable, dictyledonous, and none coniferous. I have however since found, on a recent second visit to the site, specimens of decidedly monocotyledonous wood. The beds of loose and compact sandstone, and sandstone conglomerate imbedding the silicified wood of the Egyptian and Libyan deserts strongly resemble those of Pondicherry, where the wood is also fossilized by silex, and both monocotyledonous and dicotyledonous. They rest alike on marine

* This valuable collection has been duly received and placed in the Society's Museum.—ED.

- fossiliferous limestone; in the age of which there may probably be some difference; though neither of them can be very ancient.
4. Variety of Egyptian pebble.
 5. Nummulites, limestone of the Mokattem, used in the construction of the Pyramids. It is singular that the oldest monuments reared by the hands of man should be built chiefly of a rock of yesterday, in a geological point of view. Besides these nummulites, which are exceedingly numerous, and noticed by Herodotus, who mistook them for petrified lentils eaten by the workmen, there are embedded echini, spatangi, crabs, ostrea, fishes' teeth, hippurites, turrilited shells, and numerous others, both bivalved and univalved. From the back of the great sphinx, itself excavated from the limestone of the Libyan range in situ, was quarried a block imbedding a fossil reed, hollow, jointed and striated exteriorly, nearly half an inch diameter. Rows of flint, resembling, in the manner in which they are imbedded, those of our chalk formations, and beds of fossil ostrea, occur in the limestone of the Thebaid; and the celebrated crystalloid, the morpholites or ocellated stones of Ehrenberg are scattered on the chalk-like soil of Upper Egypt. Crystallized sulphur, bituminous lignite, mineral bitumen and petroleum are found in the calcareous beds of Ezzut. Sulphate of barytes near Cairo. Rock crystal, selenite, and rock salt, arragonite, calc spar and stalagmite are pretty generally distributed. The largest and finest known deposit of the latter, called oriental alabaster, is situated near Benihassan.
 6. Iron slag from the ruins of Arsinoe; curious, as indicating that this metal was reduced in Egypt, if not in the time of the Pharaohs, at least during the Roman sway.
 7. Red porphyry—Mount Sinai.
 8. Iron ore from Hammamet—Desert of Thebaid.
 9. Shell limestone, tertiary, of Malta.
 10. Cellular basalt, from Aden. The whole of Aden, except a few recent calcareous deposits, is a mass of lava passing into trachyte, claystone porphyry, and pitchstone, penetrated by dykes of a more recent lava. The town itself stands on

the floor of an extinct crater, surrounded by an irregular fringe of black jagged peaks, save where a great gap on a level with this floor, opens upon the sandy shore of the Arabian sea. Another but narrower, gap cleaves the wall from summit almost to its base in a North and Southerly direction, affording a communication, jealously guarded, with the harbour of Back Bay. It is stated that native quicksilver has been found in the basalt of Aden by Dr. Malcolmson, in the reddish vesicular lava which is seen at Steamer Point, and which prevails pretty generally on the peninsula. It occurs in minute globules, adhering to the side of the cavities of the rock. Native quicksilver is found in primitive rocks, dark fossiliferous slates associated with Jura limestone and trap in the carboniferous series in small quantities. Its appearance therefore in a volcanic rock, so recent as that of Aden, is novel and interesting. I found abundance of rock salt, and a little sulphate of lime in the basalt of one of the islets in Back Bay, and pitchstone, calcedony, incrustations of carbonate of lime, kunker or travertine in that of Aden. In some places, the basalt is thinly coated with a powdery mineral of a sulphur yellow colour, resembling the chloruret of iron, seen tinging the lavas of Etna and Vesuvius near the summits. The basalt of Aden resembles strongly the newer basalts of the Puy de Dome, in Central France.

11. Granite, peninsula of Mount Sinai. This peninsula consists of a central cluster of granite and porphyritic rocks, of which the peaks of Sinai, Horeb, and St. Catherine are the nucleus, rising through uplifted hypogene schists, penetrated and altered by countless basaltic dykes; the whole are set, as in a framework in the sandstone and limestone, which fringes the coasts. Of the former is composed the celebrated mountain bell, *Gebel Nakhús*; the latter appears identical from its fossil and mineral resemblance with that of the Mokattem and Libyan ranges of Egypt, from which it is now separated by the coral bedded waters of the Red Sea.

Indications of volcanic agency are said to exist near Ras Mahommed at the South apex of the peninsula; and I have traced them from the

shores of the Red Sea by Gebel Ezzeit, and the semi-active volcano of Gebel Tir, through the Straits of Babel Mandel to Aden. My friend Lieut. Cruttenden, I. N., informs me, that volcanic rocks occur on the opposite shore of Abyssinia.

The singular gulf of the Red Sea is on the direct line of this volcanic zone, the existence of which is doubtless connected with the profuse growth of its submarine zoophytic forests.

The limestone cliffs on each side, like those of Dover and Calais, bear a striking petrological resemblance to each other; and, if we suppose them to have been once continuous over the tract now covered by the waters of the Red Sea, and engulfed, like the centre of the Val del Bove, by some great subterraneous displacement of matter, we need not go far to search for the sub-marine quarries, whence were derived the materials of these curious and beautiful calcareous productions.

The beds of limestone extend easterly, far beyond the borders of the Red Sea into Arabia and the Holy Land, interrupted in a few places by volcanic and plutonic rocks, and probably into Syria; where, in the vicinity of Beyroot, I have seen a rock very much resembling the compact, buff, waxy limestone of the Gebel Ataka range, flanking the western shore of the Gulf of Suez. Mr. Weaver* states the compact limestone rocks in the North of Arabia to be, in the mass, composed of coral animalcules of the European chalk, of which Mr. Lonsdale found about a thousand in a pound weight of rock, chiefly fragments of minute corallines; others entire foraminifera and cytherinæ. These animalcules, however, Mr. Lonsdale informed me, were not confined to the chalk, but existed also in supra-cretaceous limestone; hence they cannot be received as deciding the question of continuity or identity of strata. A large portion of the sands of the Libyan desert consists of bryozoa, a marine animal resembling sand grains; marine shells also occur in it, which may be regarded as additional proofs of their pelagic origin: since they are distinct from those found in the rocks whence the sands were derived.

Mr. Bowerbank has found vast numbers of foraminifera in the Egyptian agate (Egyptian pebble, No. 2,) unequally distributed through the layers composing the stone; but could not detect, in any of the

* London Philosophical Magazine, for April, May, and June, 1841.

numerous specimens he examined, any traces of the spongy remains found in the agates of Europe and jaspers of India. The Egyptian agate consists of small, irregular light coloured grains, imbedded in a banded siliceous matrix.

The granites of Sinai and Syene, have their types in those of Southern India: they are composed in general of felspar, quartz, hornblende and a little mica, the felspar usually pale rose-coloured. They pass from close grained to porphyritic. The rock said to be that struck by Moses, lying in the valley of the Forty Martyrs at the base of Horeb, is a mass of the ordinary granite, penetrated by a vein of smaller grained granite, in which I found the narrow apertures through which the monks of St. Catherine state the water to have gushed. The rock is evidently not in situ, but a dislodged mass from the granitic heights that overlook the valley.

I regret having left behind me in England, specimens of the celebrated breccia di verde, trap, hypogene schists, serpentine, slate, and sandstones that prevail in the Thebaid, between Cosseir on the Red Sea and the Nile: besides these and the formations already mentioned is a rock, more recent than all, and still in progress of formation, (No. 12,) found but as a littoral deposit, not only on the shores of the Red Sea, but on those of the Mediterranean, to a great extent, though superficial. On some parts of the eastern coast of Egypt, it has been elevated above 100 feet above the level of the sea, and imbeds many species of recent pelagic shells, corals, and, near the sea, bones of camels, grains of sand, pebbles, &c. cemented together, by carbonate of lime, into a rock varying from a friable mass loosely agglutinated, to a compact travertine. (No. 12?) It occurs from an inch to several feet in thickness. On the shores of Aden, fragments of lava are included; and on those of the Bosphorus; and at Smyrna, Mityline, and Rhodes, I found fragments of limestone and other rocks in the vicinity: at the last place also, pieces of ancient pottery elevated a few feet above the level of the sea.

In addition to the foregoing specimens there is also a series of more from Southern India, all of interest, and some highly instructive; but as the catalogue contains but few observations, it will be printed amongst those of the Museum.—ED.

*Report on a Route from Pakung Yeh in Ava, to Aeng in Arracan.
By Lieut. TRANT, of the Q. M. G. Dept.*

(No. 365.)

TO GEORGE SWINTON, ESQ.

Secretary to Government, Political Department.

SIR,—I am directed by the Right Honourable the Commander-in-Chief to forward to you, for the information of Government, the enclosed detailed report, under date the 12th ultimo, from Lieutenant Trant, of the Quarter Master General's Department, on the route from Pakung Yeh in Ava, to Aeng in Arracan, pursued by a detachment of British Troops under command of Captain Ross, of the Madras Establishment, in March last.

When the document is no longer required, I have further to request, you will return it to me for record in this office.

I have, &c. &c.

*Qr. Mr. Gen.'s Office,
Calcutta, 13th May, 1826.*

(Signed) R. STEVENSON,
Qr. Mr. Gen. of the Army.

Amherst Harbour, 12th April, 1826.

SIR,—Hostilities between the British and Burman Governments having ceased, and the British Army being on the point of returning to Prome, Major General Sir A. Campbell, K. C. B., directed Captain Ross to proceed with the 18th Regiment M. N. I., 50 Pioneers, and the elephants of the army to Pakung Yeh, across the Irrawaddy to Sembeghewn, and then to march over the Arracan mountains to Aeng.

At the same time, the Burman authorities deputed the Thanduck Woon,* (a chief of some rank, who had commanded formerly the province of Thanduck,) to accompany us as far as Aeng, and afford every assistance in his power. Through his means, we were to procure boats to cross us at Pakeng Yeh, and he was therefore sent on, in advance, in order that no delay might take place when we should arrive there.

* Named Mounza.

On the 6th March we left Yandaboo, and arriving at Pakeng Yeh on the 13th, immediately commenced crossing the troops and baggage in a few small canoes, the best that could be procured, but which contained a very small load; the whole detachment could not therefore be passed over to the opposite shore until the ensuing day. The river was here about 1,500 yards wide, but the current not being very rapid, we were enabled to swim the cattle over by fastening five or six at a time to the sides of a boat; the elephants dashed boldly into the stream, and guided by their mahouts, reached the opposite bank in safety, after swimming more than a mile.

The spot where we landed was on a long flat below the level of the natural bank of the river, and consequently under water during the rainy season; it was now laid out principally in tobacco fields, which plant grows in this part of the country in great abundance and perfection.

The town of Sembeghewn is four miles inland, but on the banks of the river a long straggling village existed, inhabited principally by those whom the advance of the British had obliged to abandon their habitations, and who had not yet availed themselves of the opportunity offered them by the peace, of again returning to their habitations. From these people we received every assistance; they furnished us with boats, and the women with baskets of vegetables and fish came into camp and soon formed a little bazar.

Although we were ready to move on the morning of the 15th, the dilatory manner in which the Commissariat Conductor delivered our twenty days' provisions to us, detained us till evening, when we marched through Sembeghewn, and encamped on the opposite side.

Sembeghewn was once an extensive and flourishing town, containing 3000 inhabitants, but now not a single habitation existed, the Burman army when retiring having burned it to the ground. The inhabitants had not yet commenced rebuilding their huts; here and there they were prowling about among the embers of their houses, or from the road-side looking at the passage of the troops, after we passed; however, part of our Commissariat was attacked, and three bullock loads of rice taken; a musket was also taken from one of the Sepoys, but I do not believe any blood was spilt. The people in the neighbourhood of Sembeghewn are notorious for their thefts and robberies,

and it must have been by a band of these marauders that the outrage was committed.

The country round Sembeghewn is an open plain, very fertile and highly cultivated, principally with paddy; and in the neighbourhood of the town are many small gardens planted with plantain, mangoe and other fruit trees. Through the town runs the Cholain river, a stream, which during the rainy season, is of considerable size.

On the 16th, we marched to Cholain Mew, on a capital road made by the orders of Menderagie Praw; a brick wall about three feet high marked the breadth for a considerable distance, and over every ravine, however small, a bridge has been erected. The country on both sides was laid out in rice fields as far as the eye could reach, and thickly interspersed with inhabited villages; it is irrigated by means of the Cholain river, which the inhabitants dam up and cause to flow over the adjoining fields. Wells also are to be met with in great abundance, and sacred groves with superb kioums* and pagodas, are seen all along the road.

The suburbs of Cholain Mew had fallen a prey to the flames, as also the city itself, and the only buildings saved from the conflagration were the kioums, and other edifices appropriated to the purposes of religion. This wanton act is said to have been committed without the knowledge of the chieftains, by some of the disorganized bands of the Burman army. Round Cholain Mew, are the remains of a lofty brick wall, and in those places where it has fallen to decay, a capital teak wood stockade was erected at the commencement of the war. The situation of the work is very strong, and on two sides completely defended by large jheels, whence by cutting a small bund, sufficient water might be procured to form a wet ditch round the fortifications. The brick portion of the latter is well worthy of remark, as offering a more perfect specimen of ancient fortification in this country than any other of the forts we have passed. One part of the wall, which seemed to have suffered less from the ravages of time than the remainder, particularly attracted my attention. Its outer height was fifty feet, and inside it rose about thirty feet above the level of the town; and this must be about six feet below the original elevation, the turrets

* Monasteries.

which formerly adorned the summit having fallen down. This great height of brick work was only between three or four feet thick, supported by slight abutments every fifty yards, and it seemed quite extraordinary, that so much of it still remained in many places tottering on its base. Near the summit of the walls, were small apertures intended to receive the beams by which platforms whence the defender's fire was sustained, and on enquiry I found these walls to be long antecedent to the use of fire arms. The Thanduck Woon informs me, that Cholain Mew is said to have been built 1500 years ago, at the time Paghaw Mew was the seat of Government, and that it used frequently to be honored with the residence of the sovereign. Menzaghee, the present Queen's brother, occupied this post for seven months, and only left it when the English army approached Pakeng Yeh.

Cholain Mew contained 10,000 inhabitants, and is the chief town of the district of Cholain, which consists of between five and six hundred square miles, and has a population of 200,000 souls. Sixty-four villages are scattered over this fertile tract, and furnished during the war, 10,000 men as their quota to the army, of whom only one-half returned.

The district of Cholain is governed by a Musghi. From Cholain Mew the road branches off to Talak, and as it was the wish of Sir A. Campbell, that Lieut. Bissett, Quarter Master General's Department, Madras, should proceed by that route with part of the force, I made every enquiry respecting the possibility of this measure being carried into effect, but the accounts were so very unsatisfactory, that it was deemed proper to give up all idea of attempting it.*

I was informed that a foot-path existed over the mountains to Talak, occasionally frequented by a few itinerant merchants, and that ponies and bullocks were the only beasts of burden by which the road could be traversed. A great scarcity of water exists for four marches, so much so, that those who went that way, used always to carry a supply of water in bamboos—the chance of finding crevices in the rocks, or pools of water being very precarious, and if found, would not prove sufficient for more than twenty or thirty men. The hills are very steep,

* There is a road from Phyang on the eastern of the Zooma mountains to Talak in Arracan, but it is even at this time so indifferent, as not to be much used.

and although the roads were naturally so very bad, the Burmans at the time they expected an attack from us in that quarter, determined on entirely destroying this medium of communication, and accordingly scarped part of the road, in others felled trees across it, and so completely closed the passage, that for more than two years not a single individual has passed that way. The Talak road was not followed by either of the Burman armies, the Maha Bandoolah having marched by Aeng, both in going to and returning from Arracan; and the Arracan army after its defeat was so totally dispersed, that the men which composed it striking into the mountains followed no regular track, but took their chance of going straight over the hills. Taking all these circumstances into consideration, as well as the risk a party would run of a party being obliged to return at a time when the British had left Ava, a circumstance, from the want of water and coolies by no means unlikely to occur, Captain Ross determined not to divide the detachment.

Many Mughs who had been forcibly seized by the Maha Bandoolah, and brought captives from Arracan, availed themselves of the opportunity offered by our passage of again seeing their native land; and I am told that a great number of Mughs are now scattered over Ava, victims of the oppressive system of the Burmahs, who invariably drive the natives of their conquered provinces from their country, and re-people it with Burmahs.

On the morning of the 17th, we left Cholain Mew, and leaving the high road to our right struck off considerably to the southward, in order to encamp in the vicinity of water, none being procurable on the main route at this season, except by making very long marches. For four months of the year, during the monsoon, water is to be met with, and it was at the close of that season the Burman army passed. Several thickly inhabited villages existed on both sides of the road, and we passed through one of considerable size called Paung-lahong, two miles beyond which we encamped, on the brink of a large jheel. It was most gratifying to remark the confidence now reposed in us by the villagers, so very different from the conduct hitherto pursued by them since our arrival in Ava. No longer forsaking their houses and flying with their families and effects into the jungle, they quietly pursued their daily avocations, and only noticed our approach by

running to the road-side when we passed, and gazing with astonishment at the first white faces they had ever seen.

The difference of soil between the east and west banks of the Irrawaddy at this part of the country is very surprising. The east barren, arid, and parched up, particularly in the neighbourhood of the Petroleum Wells, produces not the slightest vegetation; scarcely a blade of grass is to be met with; whilst the west is fertile, well watered, abounding with fine cattle, and excellent pasturage, and producing all the requisites of food. Sugar is extracted from the palmyra tree in considerable quantity, and saltpetre is also manufactured.

Our road next day lay for some miles over an extensive plain laid out in paddy fields, and bearing the traces of being completely inundated during the monsoon. Indeed, I was informed, that the whole country between this and the Irrawaddy, at that season of the year is one continued sheet of water. After marching eight miles, we came to the Mine river, a fine stream of water fordable about knee deep, and forming the boundary between the districts of Cholain and Sehdine. It derives its source from the Arracan mountains, and even at this season presents sufficient water for small canoes, many of which were plying up and down, mostly superintending the course of several rafts of bamboos which are cut in the mountains, and thence floated down to supply the inhabitants of the plains with materials for building houses. A large and populous village stood on the bank of the river, and we could discover many others lower down.

It being desirable that we should gain the foot of the hills as soon as possible, we made very long marches, and this day marched fifteen and a half miles. Our camp was pitched near a jheel at the town of Sehdine, chief of a small district of the same name, containing about 10,000 inhabitants. The town had been burned by some of the predatory bands, who had overrun this part of the kingdom.

On the 19th, we marched fourteen and a half miles through a highly cultivated country, embellished with groves of palmyra and other trees, and full of populous villages; these obtained their water from a small stream conducted by means of dams from the Mine river, and answering the two-fold purpose of supplying the wants of the inhabitants and irrigating the soil. At the village of Shoegoun, were many Shans, who came out and offered us toddy, and here for the first time we saw

some of the tribe of Kicaams.* The distances on the road to-day were marked off at every dine by small upright posts surrounded by a railing. I measured the distance between several, and found it amount to two miles and five furlongs; but this varies considerably, as a coss or dine in the mountain districts was often under two miles, whilst in the plains, it generally exceeded three. I rather suspect that the Burman distances are calculated rather by the time it takes to traverse them, than by any fixed rule; at least I have constantly found it to be the case, and in this instance particularly so. We halted at Kevensah near the Mine river, a stream of considerable magnitude, and here we for the last time saw the plains of Ava. Before us was wild jungle and forest, and in the distance, we could but just distinguish the blue summits of the Arracan mountains.

About two miles beyond Kevensah, after crossing the Mine river several times, we reached the lowest range of hills connected with the Koma Pokaung range, and commenced ascending. In a little valley at their foot, a post was stuck in the ground, to denote to the pilgrims and merchants who formerly frequented the road, that a chokey or a watch-house existed there, whence they would derive protection against the depredations of the robbers who infested the mountains. We had now regained the high road to Aeng, and in several places could see where it had been cut and levelled with no little trouble; it was in capital repair, and at certain distances, were houses for the reception of pilgrims going to worship at the Shoecotah Pagoda.† Many of these houses had been burned by accidentally catching fire from the long grass which had lately been in flames. The trees were scorched, and deprived of their foliage; and the whole appearance of these hills was as dry and as arid as could be. The jungle was not thick, and consisted principally of the male bamboo, and a few other stunted trees. Several small ponds, one or two containing a little muddy water, and the rest dry, were on the road-side, and near one of them the Burmahs formerly erected a small breastwork, the traces of which are almost quite obliterated. Emerging from the jungle on the summit of a steep ghaut, we at a mile distant perceived the Shoecotah; built on the peak of a very high and steep hill. The Pagoda and its Kioums had a

* So in MSS.

† Shwézetto.

beautiful appearance, and seemed quite a delightful spot when compared with the cold but arid scenery around. At the foot of the hills, the Mine river wound about in the most circuitous manner, and enriched a little verdant space of ground where a village formerly stood; the only spot like vegetation we could see around us, and where we consequently pitched our camp. The Shoecotah* is held in the greatest veneration by the Buddhists, as containing the impression of Gaudma's feet; one of these is on the summit, and the other at the base of the hill. These are railed in and covered over by splendidly carved and gilt temples, and attended by Phoongees,† who inhabit the Kioums,‡ at the side and foot of the hills. Pilgrims from all parts of the empire flock here to offer up their prayers, and as we entered the valley, the repeated tollings of the bells indicated that some suppliant was on the point of preferring his requests to the deity. The Burman Government derives some profit from the Shoecotah, by exacting a tax on the richer class of devotees, of from twenty to fifty rupees, according to their rank, and they are then allowed to pray within the railing which surrounds the foot. No tax is levied on those suppliants who content themselves with prayers outside the railing, but none are allowed to enter the sacred precincts without paying the fine. The unsettled state of the country of late has of course prevented the Pagoda being as much resorted to as formerly, and we found there but very few devotees. The ascent to the temple is by means of a flight of stone steps, 970 in number, and is covered from the weather by a wooden roof supported by numerous pillars.

During our march on the 21st, we followed the course of the Mine river for several miles, ascending almost imperceptibly the whole time, and after crossing a low range of hills, entered a delightful valley about a mile in width, watered by the Mine river, with numerous habitations on its banks, occupied partly by the Kicaam tribe, and a little further on stood Napeh Mew. The Thanduck Woon had been appointed to the charge of the district of Napeh a short time before, and had preceded us to take possession of his Government, and also to procure some rice for the troops, as we thought it best to provide against accidents by having a few days' provisions to spare.

* Shwézetto.

† Priests.

‡ Monasteries.

Napeh Mew is a very pretty and neat town, though of but inconsiderable size. It is situated on a rising ground, commanding the whole plain, and rendering it a good military position; an old teak-wood stockade encircled it, and out-side other small works had existed, which until lately were occupied by a body of 3,000 men levied in the neighbouring districts, and forming a corps of observation. After the capture of Melloon, this force broke up, and part joined the enemy at Paghaw Mew, whose defeat it shared.

The district of Napeh contains twenty-four villages and 4,000 inhabitants, of whom 300 were obliged to bear arms during the late war, but they limited their warlike efforts to the care of their own district. Napeh Mew is the last Burman town or village. Towards the mountains, a few hamlets exist further on; but are inhabited by those Kicaams who have placed themselves under the authority of the Burman Government. It was in the paddy ground belonging to one of these villages, called Doh, that we encamped near a small rivulet bearing the same name.

The inhabitants of the place at first were running off, but being re-assured, returned and gave us a good opportunity of remarking the difference between this tribe and the Burmahs.

In appearance the men are much inferior to their neighbours, their countenances being flatter, and not so regular as the Burmahs; the dress also differs, and is very simple, a black cloth striped with red and white is thrown over the shoulders, a black cloth is worn round the loins, and a black jacket is occasionally used. They bind their hair with a fillet of black or white cloth, and with a spear, a cross-bow and a quiver full of arrows, a dah and a pouch to contain tobacco and betel, their dress is complete. The women merely wear a black petticoat reaching to the knees, and adorn their necks and the hem of their garments with cowries and glass beads; all the menial offices of the house devolve upon them; they procure water for the daily consumption, pound paddy and dress the food of the men, who are generally employed in fishing or tilling the land. The young Kicaam girls are rather pretty than otherwise, but a custom which has been handed down to them by their ancestors, stamps many of them with the brand of ugliness, and renders them most hideous objects. This consists in tattooing the whole face in segments of circles with a blue mixture,

leaving the neck its natural colour, and thus giving them the appearance of wearing masks, were it not that the deadly appearances of the white spaces round the eyes and the livid colour of the lips indicated the transformation to be indelible. These Kicaams* are a quiet, inoffensive set, and must be distinguished from the Kicaams of the mountains, inasmuch as they have placed themselves under the Burman Government, and are liable to be called upon for their quota of men in case of war, and pay taxes, whereas the others are quite independent. Residing in the most remote and unfrequented recesses of the mountains, the Kicaams hold themselves aloof from, and are entirely independent of the rest of mankind, whom they consider their enemies and lawful prey; and acknowledging no sovereign, they herd together in small parties of thirty and forty, and select some fertile spot in the neighbourhood of a mountain stream, sufficiently large to cultivate grain for their consumption. There they erect their miserable dwellings, and with the produce of the land, consisting of rice and turmeric, continue to subsist themselves. The rivers furnish them with abundance of fish, and they will eat any animal, however disgusting it may be. The origin of the Kicaams is lost in fiction, and of the details of their early history the present race know little except from vague traditions, verbally transmitted from one generation to the next. They, however say, that in former days the plains of Ava and Pegu were peopled by their race, and under the dominion of one of their kings, when a horde of Tartars made a sudden irruption from the northward, and overran the country. For some time the interlopers kept the appearance of friendship with the aborigines of the soil, but becoming daily more formidable, and having secured a footing in the land they threw off the mask, and electing a king amongst themselves, declared themselves independent of the Kicaam king. The Tartar chief then sent to the Kicaams and desired their allegiance, stating, that it was contrary to the dictates of nature that two kings should reign, or that two races of people should exist in the same land, and having deposed the Kicaam king, and put many of the chieftains to death, obliged the others to seek for refuge in flight. The remaining chieftains therefore with their attendant villages collecting all

* There are a great many of them in Arracan, who still observe the custom of tattooing the face. They are called Kaiengs.

their cattle and other valuables, availed themselves of the first opportunity of escaping from the thralldom in which they were held, and fled to the lofty and remote mountains on the frontiers of Siam, China, and Arracan, where they considered themselves safe from the persecution of their conquerors, whom they left in undisputed possession of the plains. With them went some members of the royal family, but in the course of time, from deaths and changes of residence, all traces of them were lost, and the Kicaams of this part of the country knew not whether any of the royal blood exist or not. Divested as they now were of a common head to whom they could look up for advice, they in each village selected from the community one, who either from age or experience, was deemed worthy to be their chief, and in this independent state they have since remained, each little hamlet considering itself as perfectly distinct from those adjoining.

These small republics have since resisted all attempts at much intercourse with their more civilized neighbours, and have preserved unsullied their innate love of liberty and freedom.

Only one trace still exists of supreme authority, and this in the person of the *Passive*, or head of their rude religion. This personage resides near the source of the Mow river, on a mountain called the Pyon, and by his descendants in the male and female line this office of prophet or soothsayer is filled. Writing being unknown, their mandates are delivered verbally, and implicitly obeyed; to them every dispute of importance is referred for arbitration, and in cases of sickness or marriage, they are always consulted. The tenets of the Kicaam faith are most simple; they have no idea of the Supreme Being, nor have they any tradition respecting the creation. They are the children of the mountains, and nature alone has any claim on their feelings. In consonance with this idea, they consider that every thing which is useful to them, or conduces to the luxuries of life, ought to be held in the greatest veneration. The principal object of their adoration is a thick bushy tree bearing a small berry, and called by them *Sabri*. Under the shade of its branches, they at certain seasons of the year assemble with all the members of the family, and offer sacrifices of oxen and pigs, on which they afterwards feast. Their cattle accompany them during these excursions, and partake in the respect paid to the tree, as being the most useful of those blessings which have been so sparingly

bestowed upon them. Another object of adoration is the thunder-bolt, or rather I should suppose the meteoric stone. Whenever a thunder-storm occurs, the Kicaams watch with the utmost anxiety the spot where the lightning strikes, and when the weather is again calm, they proceed to the place they had marked, and examine all the trees, to observe whether any had been scattered by lightning, or their branches broken. Should they be so fortunate as to find one, they immediately dig the ground under the injured bough, and commence searching for the sacred stone, which is generally about the size of the hand, and by them supposed to fall from heaven. This stone is supposed to possess the most supernatural qualities, and its appearance is hailed by the sacrifice of a hog and a bullock, ending in a feast; after which it is delivered over to the care of the passive, who keeps it as an infallible talisman against every sort of disease.

Their ideas of the difference between good and evil consist in supposing, that those who honour and respect their parents, take care of their children and cattle, and eat most meat, and drink spirits to the greatest excess, will be well provided for hereafter, and their souls transferred into the bodies of oxen or pigs; whilst those whose sensual appetites are not so great, and who do not enjoy to the utmost all the good things of the earth, which may be thrown in their way, are considered unworthy of a future reward, looked down upon and contemned. Although it is evident that the Kicaams partly profess the doctrine of transmigration, yet it seems most extraordinary that they should not only feel no compunction in killing their cattle, but deem it a meritorious act. It must, however, be observed, that the sanction of the *Passive* is necessary before an animal can be slain.

When any one dies, the event is hailed as a joyful circumstance, and the relations give a grand feast to which all the village is invited, when the degree of affection borne to the deceased is shewn by dancing, eating, and drinking in prodigious quantity. Then, should the defunct be a man of property, his body is burned, and the ashes being collected are placed in a basket, and either taken to the mountain of Keoungnatyne, near which we passed when marching from Shoecatah, or to the mountain of Yehaartoung, and there deposited. The latter mountain is very sacred and very lofty, "for (to use the words of my uncouth, uncivilized informant) from its summit the whole world

could be seen." Over the tombs of the chiefs a house is erected, and people are left to watch and defend it from malevolent spirits, and a log rudely carved to represent the deceased is laid there for the same purpose. The poor people, if not in the immediate neighbourhood of Yahaartoung or Keoungnatyne, are buried any where in the vicinity of their own village.

Matrimony with the Kicaams is purely a civil contract, unhallowed by any religious ceremony. The contracting parties proceed in the first instance to the *Passive*, whose advice is requested respecting the match; if his opinion is favourable, the bridegroom sends the parents of the damsel a present composed of a pig, an ox, a spear, a tom-tom, a dah, and calabash full of spirituous liquor distilled from rice. A grand feast is then given, at which all the relations attend, and the marriage is considered as solemnized.

Should the lady after marriage prove false to her marriage vows, and the gay deceiver be discovered, he is obliged to present a hog, an ox, and a spear to the injured husband, and a fine string of cowries to adorn the neck of the fair one, who after this peace-offering is considered quite exonerated from any blame, and is re-admitted to her husband's favour, without her reputation being in the least degree tainted.

In the case of an illicit intercourse being discovered between two young Kicaams, the man is obliged to pay a bullock to the girl; but if she becomes a mother, she claims him as her husband, and if he refuses, another bullock is the penalty inflicted on him; he takes the child into his own charge, and the damsel is restored to her fair fame.

The virtue of a chieftain's daughter is estimated at a much greater value, no less than three bullocks being the fine for leading her astray from the path of rectitude, and the same number, should the offender refuse to make reparation by marriage. Marriage is not permitted in nearer consanguinity than cousins, but incest, although a crime but seldom heard of, is absolved by paying only one bullock to the father. A divorce can be procured at the same expense.

If a murder is committed, the perpetrator is immediately seized by the village chief, who obliges him to give up three of his friends or relations as slaves to the family of the deceased, or ransom them at the rate of thirty rupees a man, thus estimating human life at the moderate sum of ninety rupees; but if the murderer is unable to pay

the fine, or produce his sureties, he is himself kept in servitude. Should he escape and take refuge in another village, the inhabitants of it immediately return him, if they have a proper sense of propriety ; but if they do not, and refuse to send the Kicaam back when demanded, war is denounced against them, and their village destroyed. The murderer if taken is recommitted to slavery, it being expressly recommended them by the *Passive*, not to shed the blood of each other.

Theft is not considered a very heinous crime, but should corn be purloined, the offender is obliged to purchase his own freedom, either by finding a substitute, or paying thirty rupees.

The Kicaams have no knowledge of medicine, but on the contrary, appear to hold it in great contempt. When therefore a man is taken ill, he is taken to the *Passive*, who first partaking of a feast prepared by the friends of the invalid, recites incantations over him, and uses the meteoric stone as a charm against the ravages of the disease. If these do not prove efficacious, the man is left to his fate, and no further exertion made to save him.

Hospitality is a virtue which it is difficult to ascertain whether they would put in practice or not ; shunning as they do all intercourse with strangers, the manner in which one intruding on their haunts would be received, seems rather problematical. They, however, state that if a foreigner was to fall in with one of their villages, he would not be ill-treated, but they did not recollect such a visit ever having taken place.

From the wild cotton growing in the mountains, the Kicaam women fabricate their own clothes, and even make enough to become an article of traffic with the lowlanders. Silver is not procure in the mountains, but iron ore is found in considerable quantity, and with honey and dried fish, form their principal articles of trade ; these they carry into Arracan and Ava, and exchange for money, or such articles of food and clothing, as their own wilds have denied them.

With the use of fire-arms they are generally speaking unacquainted, and seem to hold them in great awe ; their own weapons are the spear, dah, and the cross-bow with a quiverfull of arrows. The latter are made of bamboo, with the point hardened by fire, and doubly barbed. They are deeply poisoned, and the slightest touch inflicts

instant death. This poison is vegetable, and procured by making an incision in the bark of certain trees, and collecting the liquor which exudes

The frightful custom of tatooing the faces of the women, derives its origin from a very curious story, and one that reflects much credit on the inhabitants of the mountains. At the period when the Tartars conquered the plains, and drove the Kicaams to the mountains, they imposed an annual tribute on this persecuted race, and in default of payment, used to seize the prettiest of the mountain beauties, and collecting a considerable number, present them to their despotic sovereign, who selected from the groupe those whom he deemed worthy to adorn his seraglio. To such an extent was this monopoly at last carried, that the Kicaams in order to save their race from extermination, persuaded all the servile women to sacrifice those personal charms which drew such a dangerous distinction on them, a proposition with which they immediately and cheerfully complied, and tatooed their faces.* When these hideous creatures were presented to the monarch, he sent them back in great wrath, and ordered a fresh search to be made for new objects to fill his haram. It, however, proved fruitless, all the young girls had undergone the test of freedom, and none remained unblemished, save old women and children. Foiled thus in his attempt to destroy the happiness of the inoffensive Kicaams, the tyrant turned his views elsewhere, and no longer molested them. The custom, however, still remained, and it is only latterly that it is falling into disuse, the women never tatooing till between thirty and forty years of age, and then it is a mere matter of choice.

From the little I have seen of the Kicaams, I should suppose them to be quiet, and entirely devoted to agricultural pursuits; but as those individuals I have met with were mostly all living in a comparatively civilized state under the British and Burman Governments, it would not be a fair criterion to judge the generality by them, particularly as all accounts agree in stating them to be savage, and addicted to plunder and rapine. To judge, however, by their simple code of laws, they are not by any means deficient in the knowledge of right and wrong, and are quite aware of the footing on which men stand with each other.

* The precaution is certainly superfluous with the present generation.

I therefore doubt not but with lenity and kindness they might be induced to mix with their more civilized neighbours, and become useful members of society.

Clearing the village of Doh, we followed the bed of the Mine river, and entered a deep Pass formed by the lofty mountains through which this stream runs. Rising almost perpendicular to a great height, they completely hemmed us in, and their summits and sides clothed with trees, now of a verdant appearance, shielded us from the rays of the sun, and rendered our march very pleasant and interesting.

On our road, we met several Kicaams with dried fish, which they catch and dry here, and then take to their families. With the exception of these straggling individuals we saw not a soul, nor the recent traces of any one during ten miles we marched through this dell. We encamped at the first spot we could find which afforded sufficient width to pitch a tent, and were so fortunate as to procure plenty of forage, although I had been told we should find nothing for the cattle but bamboo leaves. So far from that being the case, the vegetation as we advanced, became more and more luxuriant; the most delightful variety of brilliant foliage hung over the stream, rills of water abounded in the mountains, and large masses of rock, torn from their original site by the mountain torrents, lay here and there in the bed of the river, and occasionally damming the streams up, caused it to rush down in waterfalls, giving the whole scene one of the wildest and most romantic appearances imaginable. Our road this day, though far from good, hung over the rocks and loose stones in the course of the stream, and might in a short time, with but little trouble, be made passable for wheel carriages; but during the rains I should suppose the force and depth of the torrent would prevent a passage being effected.

After winding through the bed of our constant companion the Mine river for four miles, we arrived at the post of Kaong, where two or three good houses remained, which had been occupied by a Burman picket. At this point the river divides into two branches, and the road begins ascending the mountain, the ascent for a mile is extremely abrupt, as it runs up a tongue of land proceeding from the main range, and which is so very steep on the sides, that the road has necessarily been made almost strait up the hill. When we had ascended a couple of miles, we marched on the summit of the ridge, which was not more

than fifteen or twenty feet wide, and the declivity on each side exceedingly abrupt. Across this part of the road a small stockade had been erected, which completely enfiladed the path for a considerable distance. This work was called Keonkrias, and was supplied with water from a stream at the bottom of the valley; it may have contained about 100 men.

Pushing on as rapidly as possible, we, after marching four miles over a continued ascent, reached the fort on the highest point of the mountains, and here the road, which for some distance had been as good as could be wished, became very abrupt and much broken, the rain having forced away great part of it. We had been marching all day, and were it not for the refreshing shade thrown by the lofty trees under which we passed, should have suffered much from the heat, and want of water; as it was, we were not a little fatigued when we gained the summit of the mountains, and halted at a small stockade called Nariengain. Our labours, however, were amply repaid by the grand scene which opened on our view. Below in every direction, rose immense mountains beautifully wooded from the summit down to the very base, and giving rise to the Mine river on the East, and the Aeng river to the West, both of whose numerous sources could be distinctly traced in the ravines falling from the mountains. We were now exactly on our frontier line; on one side lay the British territory, and on the other the dominions of the king of Ava, and had it not been that the weather was hazy, I am informed the view would have comprised the sea, and the plains of the Irrawaddy.*

The little stockade of Nariengain is built on our line of demarcation, and in the event of future circumstances rendering it advisable to establish military posts on our frontier, would prove an excellent position, as it is the complete key of the Aeng road, and commanding the ascent both from the Arracan and Ava sides, would prevent the Burmahs availing themselves of many strong Passes, where they might annoy and impede the advance of our troops.†

* Chedooba, Ramree, and various other islands on the Arracan side are distinctly visible from this point, and is also the Irrawaddy river for many miles of its course.

† Every officer who has inspected this Pass, will testify to the correctness of this statement.

Nature indeed could not have formed a more formidable, or easier-to-be-defended barrier than the Arracan mountains, every step presenting a Pass or hill, which might be defended by a handful of men against hundreds, and the jungle offering a sure asylum to the vanquished.

The water at Nariengain was so difficult of access, that the cattle could not approach it ; but it was of good quality, and in quantity sufficient for our consumption. It is quite a mistaken idea, that no water exists in these mountains, there being numerous springs in all the hills ; but these rising about half way from the summit where the road runs, the difficulty of access to them is very great. This might be avoided by cutting paths to and from them ; and digging reservoirs of sufficient size to water the cattle, would always ensure a supply, as the spring in a short time would replenish them.*

At night we were enveloped in a cloud, and the air became much colder, but having no thermometer, I could not ascertain the difference of temperature, and the want of proper instruments in like manner prevented my fixing the height of the mountains.

The great range is called the Komah Pokong Teoung,† and runs in a direction about S. 20 W., falling to the East in a succession of parallel ranges, and on the West more abruptly to the sea. The mountain on which Nariengain is situated is named Morang-mateng-toung. In early times the Kicaams used to prowl about this road in search of plunder, and attack and murder any traveller they might chance to meet with ; but as their numbers were never very great, the merchants who formerly passed this way united their forces, and forming little caravans of from 30 to 300 men, placed themselves beyond the power of these savage marauders. A great trade was carried on before the war between Arracan and Ava, in which it is said 40,000 people were annually employed. The former country exported Indian and European manufactures ; such as velvets, broad cloths, piece goods, silks, and muslins, and beetlenut, salt and other articles, the pro-

* This is most perfectly correct. For many years it was believed that Nariengain was devoid of water. Captain Pemberton and others failed to find it, but when Captain Bogle and a party visited it in January 1839, it was found in abundance, and of most delicious quality.

† In Arracan, these mountains are named Yeohmatoung.

duce of its own soil receiving in return ivory, silver, copper, palmyra sugar, tobacco, oil, and lacquered boxes.*

It was principally to further this intercourse that the late king of Ava, Mindraghee Prah, caused this superb road to be made, a work which reflects the greatest credit not only on the liberal mind of him who planned, but also on those who carried it into execution. The labour bestowed upon it has been immense, as for nearly twenty miles the road is cut out of the hill side to the width of between ten or twelve feet, and that with the most judicious attention to the different falls of the ground. The remains of a parapet formed of trunks of trees are visible in many places, and it would be very advantageous if something of the kind still existed, the precipices being most terrific, and of such a depth, that if any animal lost his footing and fell over, his loss would be inevitable. The Aeng road was first commenced in 1816, under the superintendence of the Thanduck Woon, and other chieftains, through whose territories it passed, the whole plans in the first instance having been laid out by the Engineers of the king. During the first two years, only 500 workmen were employed, but then the road having been completed nearly up to the summit of the mountain, 200 more were added, who finished it as far as Shoecatah, each man receiving seven rupees a month wages. But what contributed more than any thing to the completion of the road was, a most sensible rule enforced by the Burman Government, by which in lieu of taxes on their merchandize, they obliged all the travellers to carry with them working tools, and repair those parts of the road which might require it, or facilitate the access to the water.† Thus constant use, instead of spoiling the road, only improved it, and it is only owing to the stagnation of commerce during the last two years, and the consequent encroachment and the ravages of the monsoon, that any part of our route was bad,—for as the communication is closed between May and January, the damage sustained during that period must be annually repaired.

* The trade greatly increased after the peace, but has become almost extinct since the accession of Tharrawady.

† This road has within the last three years been very tolerably repaired, all the bridges which had fallen into decay restored, and a new road of upwards of twenty miles in length, has been constructed from the village of Aeng down the river toward the sea, so that troops, &c. may be landed below the shallows.

We were unable to leave Nariengain till 10 o'clock on the 24th, the road down the mountain having been completely blocked up by large trees felled across at every few yards; the descent for six furlongs was exceedingly rapid, and brought us to a small open spot used as a halting place by travellers, and named Koaronkire.* Here a fine stream of water issued from the hill, and being dammed up afforded great refreshment to our jaded cattle. A little further on, was another small stockade in a capital position, and defended by an abbatis extending some distance down the road, which for two miles more was much impeded by trees; and had it not been for the exertions of Lieut. Davinire and his detachment of Pioneers, would have impeded us considerably; as it was, we did not arrive at Jooadah,† though a distance of only six miles, until sunset. The latter part of the road was through a bamboo jungle, and as we passed along, we heard the screams of innumerable baboons, and observed the recent tracks of many wild elephants.

On the 25th, we still continued descending the same tongue of land, and after marching eleven miles‡ arrived at Sarawah, on the banks of the Aeng river. Thence to Aeng, where we marched on the 26th, was fifteen miles, the road occasionally crossing the Aeng river, and several other smaller streams; over the latter substantial wooden bridges had been thrown, of sufficient breadth to admit any species of wheel carriage, but time had so much impaired the wood, that they had all fallen to decay,§ whilst those which age had spared, had been purposely destroyed by the Burmahs. Six miles before entering Aeng, the road leaves the hills, and from thence is superb, being quite level, and about twenty feet wide.

Aeng when we entered it contained but few inhabitants, but formerly it was of considerable size, and was the emporium of all the trade between the two kingdoms.|| The tide runs past the village, but at this season of the year there is not water enough for boats of any size within six miles of the wharf. We had been informed on

* The road from this landing place to the frontier line, five marches, is probably much less difficult even for Artillery than the Bolan Pass.

† Wadait.

‡ This part is by far the most difficult of any.

§ Lately repaired.

|| It has since revived, and is now a place of some little consequence.

leaving Yandaboo, that a depôt of provisions had been formed at Aeng, and had consequently only brought twenty days' provisions with us from Pokong Yeh, which were nearly expended; but there were no signs of any thing of the kind, and a small detachment of sepoy who were stationed there, informed us they had only arrived ten days before, and knew nothing about it. Captain Ross, therefore, directed me to proceed to the nearest military station, and report our arrival. On the 28th, I arrived at "Amherst Harbour," just in time to stop the departure of a detachment under Major Auriol, European Regt., and the boats and provisions belonging to it, destined to reconnoitre the Aeng road, which being no longer necessary, Commodore Hayes and Lieut. Col. Garnham, directed the boats intended for their conveyance to proceed with provisions for the 18th Regt. at Aeng, and then bring them down to "Amherst Harbour," where transports would be ready to receive them. On the 5th April, the detachment left Aeng, having previously sent the elephants to Arracan, and on the 16th, embarked for Madras.

It is very satisfactory to observe, that although during our march from Sembeghewn we averaged more than ten miles a day, and were much exposed to the sun, we only lost one man by death; and that when we entered Aeng, only three men were sufficiently unwell to be carried in doolies. The loss in cattle only amounted to a few bullocks, already jaded when we started, by the long march from Prome to Yandaboo. We also lost four elephants, and one who was allowed by his *mahout* to stray away.

The advantages of this fine road leading in twenty-five or thirty marches to the capital of Ava, more than counterbalances the fatigue and trouble likely to attend the passage of artillery over the mountains, where in many places, from the great ascent, bullocks could be of no use in dragging the guns, which must therefore be necessarily pulled up by sheer force of arm. For the same reason, it would be impossible to convey the Commissariat or other stores in carts.

That part of the road which requires most actual making, is for eight miles in the bed of the Mine river, where the annual torrents are continually changing the position of the rocks and stones; but this could be easily remedied, as abundance of materials are at hand with which a road might be made.

Some parts of the road on the mountain require a good deal of repair and widening, and it would be requisite to sink tanks at the watering places and cut paths to and from them; but taking every thing into consideration, it is my opinion that a battalion of Pioneers sent one week in advance, would render the road quite passable for an army. The want of sufficient open ground to encamp in, would prove an inconvenience, but does not exist for many marches.

The importance of the new road we were exploring, the circumstances of the country we passed through, never before having been traversed by an European, and the manners of the natives we met with, being but little known, have induced me to make this unusually long report to you, in the hope that some of the information it contains may perhaps hereafter prove useful, should the Aeng road again be passed by British troops.

I have &c. &c.

(Signed) T. A. TRANT,

Lieut. H. M. 95th Regiment,

Deputy Assistant Quarter Master General.

To the Quarter Master General of the Army, Fort William.

Judicial Department, the 7th November, 1837.

(True Copies,)

(Signed) F. J. HALLIDAY,

Officiating Secretary to the Government of Bengal.

Capt. MANSON'S Journal of a Visit to Melun and the Oonta Dhoora Pass in Juwahir. Edited by J. H. BATTEN, ESQ. C. S. for the Journal of the Asiatic Society.

In our Proceedings for March 1842 will be found an account of the recovery of a part of Captain Herbert's Journal of the Mineralogical Survey in the Himalaya, and in those of August the kind offer of our most zealous and able associate Mr. Batten, Assistant Commissioner in Kemaon, to edit Captain Manson's Journal, which forms part of Captain Herbert's papers, which we need not add was most gratefully accepted by the Society. The following paper is the one which he there alludes to, and the reader, or the intending traveller, will peruse it with the satisfaction of knowing that its details and its experience are fully confirmed by two more travellers in those dangerous regions.

The scientific geologist and naturalist will perhaps at first regret that they do not find more details falling in with their studies, but we must beg of them to reflect that the writers and editors of such papers, though they may lay no claim to scientific qualifications (so difficult to acquire in India,) are nevertheless rendering a service of first rate importance to the cause of science; and this is the important service of *pioneering*. We could say much on this subject, for few remember, and many keep out of sight, what they owe to the humble and often forgotten labours of those who have undertaken the thankless work of chronicling a first exploration, or their first labours in a new branch of science: but we may comprise it all in a single question. What will not some future Humboldt, with guides like these ready to mark out his path, be able to accomplish amongst the yet hidden wonders of the stupendous mountains of India?—H. P.

15th September.—First march beyond Booe* up the bed of the Raálim torrent; fall of the torrent very great; direction of it about N. and by E. About six miles up, another stream falls into it, whose course is about E. N. E. when the former turned a little to the west of North.

N. B.—Crossed the stream over a snow-bed at the Sábá (or Great Oodear. A specimen of red raspberry, ripe, and very pleasant to the palate. Marched at 7h. 50m. and reached our ground at 4h. 5m., distance about twelve miles, road pretty good. No tent up; slept under a large rock (or Oodear†); heavy rain during the night. At 6 P. M. thermometer 50°.

16th September.—7 A. M. thermometer 45°; barometer 20.250; t. m. and air 52°; m. t. 45° 5'. Marched at 10h. 36m. A. M. The road continued for a mile up the bed of the torrent, the rock chiefly gneiss, little or no granite; ground on the right bank sloping, steep on the left, strata generally dipping to the N. E.; commenced a short but steep ascent from the torrent, passed through a few birch trees, (the only ones on

* In Webb's map, (Indian Atlas, No. 66,) Bhooe on the left bank of the Goree river is noted, above which to the north are also marked the Snowy Peaks, Nos. XVI, XVII, and XVIII of the Kumaon Survey, on the same side of that river; but no mention is made of the Raálim river which joins the Goree opposite the Pass called Leepooke Than, or Hurdol, and beneath the Peaks XVI and XVII. When the route by the Goree, owing to the loss of bridges or an unusual fall of snow, or the carrying away of the road is closed, the Juwahir Bhootias proceed to Raálim along the torrent of that name, and so on towards Melum.—J. H. B.

† Odhéar is a *cave*, or any arched recess in the rocks, and used by the Bhootias for the shelter of themselves and sheep with their loads.—J. H. B.

the road); the path then continued along the sloping side of the mountain, ascending occasionally, with a little descent here and there. Ground covered with the wild strawberry? (or potentilla.) Little or no rock visible; gradually changing from gneiss to a kind of mica slate, and from that into a greywacke and talcose clay slate. Arrived at our tents at 2h. 45m. P. M., distance about five miles. The village of Raálim, about two miles further on, consists of about twelve mows (families.—J. H. B.) The torrent to this had a northerly course, and from this as far as visible to a large snow bed; its course* is about N. E.—4h. 15m. P. M. barometer 19.207; t. m. 54, air 50; m. t. 49°.

N. B.—Could procure only twenty-one coolies from the village. A road leads from this up the bed of the torrent, four days' journey for loaded men, to the village of Sheebooh† in Dhurma, but very bad and dangerous.

17th September.—8 A. M. thermometer 42°. Marched at 9h. 32m.

Specimens
50 to 54. A. M., and commenced a very steep ascent; the rock to the top of the Pass of Bircheegung, clay slate, talc slate, and greywacke, and near the Pass, a few blocks of quartz. The whole ascent occupied three and half hours; the higher we ascended, we felt the difficulty of breathing greater, and consequently the fatigue of walking; found I could not walk more than from ten to twenty paces, according to the steepness of the ascent, my legs feeling as if they would drop off. When two-thirds up the ascent, a snow storm came on, (but the snow melted as fast as it fell to the ground,) when the thermometer immediately fell to 32°. At the top of the Pass, at 1 P. M. it was 30°. As we ascended, vegetation gradually decreased, and towards the summit of the Pass, wholly disappeared, and nothing but broken fragments of clay and talc slate and quartz presented themselves to the eye. The Pass, judging from the time taken to ascend it, and from all vegetation ceasing, must be at least 15,000 feet; but owing to the lad who carried part of the apparatus belonging to the barometer having preceded me some distance, I was unable to

* From the sketch and the text, it appears that the writer does not mean by *course* and *direction* of the Raálim, the course of its current (for, that is in a southerly direction,) but the line of ascent along its bed, and towards its sources.—J. H. B.

† Seeboo.—J. H. B.

set it up. The vegetables up the ascent consisted chiefly of a species of potentilla and dwarf juniper, which did not rise more than six inches from the ground. On the descent, the rocky fragments continued much lower down than on the opposite side without vegetation. The descent occupied two and half hours near the bed of the Goree river, whose course* here, towards Melum, is about N. W. and by N., when it takes a direction more to the N. Crossed a small torrent near its junction with the Goree on a *sanga*. The temperature of the water was 46°, air 51°, and moist thermometer 48°. The snow continued to fall for about two hours from 12 to 2 P. M., and for about three-quarters down the descent, when thermometer rose to 40°; towards the bottom of the descent, the neighbouring mountains covered with birch jungle and a species of dwarf rhododendron. Arrived at the village of Tola, consisting of from thirty to forty houses at 4h. 25m. P. M., being about seven hours on the road; being one of the most fatiguing marches I ever made. The rock down the descent, chiefly clay slate. The sides of the mountains near Tola have a very shattered and precipitous appearance.

18th September.—A halt, a fine clear day, 9 A. M. thermometer 49°; 2 P. M. air 62°, in sun 66°; moist thermometer 51°. In the sun covered with wool (black,) and laid on a dark soil, it rose to 117°. Nunda Debee visible, bearing West. Two days journey from this village, a good deal of level ground, well cultivated, in the neighbourhood of Tola. The inhabitants dirty and ill-looking, and the village surrounded by filth; demand one rupee for six and half seers of attah, which at Munsaree, six days' journey the direct road, was procured at the rate of twenty-four seers per rupee. They have here fine Tartar sheep, for which they ask two rupees each; they have nearly twice the bulk of a Plain sheep, and have long twisted horns.—4h. 15m. P. M. barometer 20.235, air 765.5, moist thermometer 47°.

N. B.—Purchased three large Tartar sheep for two rupees each, two of them a male and one female for breeding.†

* Vide note marked † preceding page—J. H. B.

† Lieut. J. A. Weller, Executive Engineer and Officiating Assistant to the Commissioner of Kumaon, has just arrived from a tour to Jwahir, and has kindly added some side notes to this Journal in addition to my own; besides very handsomely placing parts of his own Journal at my disposal for the use of the Asiatic Society.—J. H. B.

19th September.—7 A. M. thermometer $43^{\circ} 5'$, moist thermometer 39° . Very fine clear morning, towards noon became cloudy, and it rained gently all the afternoon.

Picked up near the village specimens No. 55 to 61, most of them
 Specimens containing copper (?) Some disseminated, some in
 55 to 61. small veins, and some in pyrites. This ore seems
 to occupy very generally the rocks up the bed of a small stream
 which runs close to the south of the village; it does not appear in
 any of the soft friable, slaty rock, which is the general rock, but in
 that of the harder kinds, and in quartz.

20th September.—Halt; morning cloudy, gentle rain during the
 forenoon, cleared up a little towards 4 o'clock. At 2 P. M. thermometer
 $52^{\circ} 5'$, moist thermometer 48° . The ooa jhow* is just ripe here,
 and is being cut. It is sown sometime in the month of May. Turnips
 are grown here, but they are small and strong; they say they were
 brought from Dhurma.

They say it is two days' journey from Melum to the Pass, and from
 thence four days to Neetee; two alternate days no village to encamp
 at, the whole road within our own boundary.†

They travel for five days from the bottom of the other side of the
 Pass, before they come to any Tartar habitation. There is no chokee
 near the Pass at present, to prevent any traveller approaching the
 opposite side. There is a road from the Pass through the Tartar fron-
 tier to Branse, fifteen days journey.

21st September.—Halt; morning fair and clear, fresh snow on all
 the high neighbouring peaks. 10 A. M. thermometer 46° , thermo-
 meter in sun 52° , hoar frost in the shade at this hour. Observed the
 hour of noon to-day, and found our watches a quarter of an hour too fast.
 The people here say, they are not subject to be visited by severe
 storms at this season, (the Equinox,) and that only a little rain and
 snow fall. There has blown, however, every day since our arrival here,
 a very unpleasant cold wind, which sets in about 12 or 1 P. M., and
 continues till near sunset. The Bhoteeahs here reside in the hot

* Ooa Jow, *Hordeum cœleste*.—J. H. B.

† Not if Oonta Dhoora is our boundary; as that Pass has to be crossed to reach
 Gertee, which is intermediate between Oonta Dhoora and Neetee. See Sketch No. 1.
 —J. A. W.

season at Saean, and the Pudhán,* (an old man,) is a regular Jew in all his dealings, even endeavouring to find out what will be offered for an article before he himself will fix any price, even to the smallest trifles. 1h. 45m. P. M. ther. in open air $50^{\circ} 5'$. moist ther. $43^{\circ} 5'$, since 12 A. M. it has gradually become cloudy and windy, and is now raining, but not heavily. The grains, &c. grown here are oohah jhow, phāpher,† tur-nips, sursōn.‡

22d September,—Fine day, but snow falling on the highest peaks. Marched at 1 P. M., the road partly level along the side of the mountain; numerous slips, and some parts precipitous and dangerous. The rock between Tola and Boōnpēr has a much less slaty structure than that near the former village, but continues very metalliferous to within about a mile of Boōnfer; some of the specimens picked up contain rather large crystals of copper (?) very well defined, but rather scattered through the rock. The general character of the rock is

Specimens (I think) graywacke, some very hard, and specimens
61 to 75. broken off with much difficulty. A good deal of quartz was also observed along the road, &c. No. 67 is chiefly composed of felspar. Some specimens procured in this march have attached to them some well defined crystals of quartz, &c. The sides of the mountains, whence all the rocks from which the specimens were procured, have a very shattered appearance. There can be little doubt of their containing some large deposits of ore, which might be discovered, I should think, without much difficulty. On the road about half way, found a large deposit of decomposed felspar, some veins of it beautifully white.

Plants Collected.

Two species of juniper, one in seed, the other just coming into flower. A shrub very like the sweet-briar, but with no smell. A small herbaceous plant differing in appearance, but with the same scent as the plant well known by the name of "old man," or southernwood. The gooseberry, just ripe. The currant, (no fruit.)

* Head of the village, Malgoogar—Lumberdar.—J. H. B.

† A species of Polygonum.—J. H. B.

‡ Sinapis dichotoma—J. H. B.

The Bis.

The natives here have an idea, that people passing through a jungle of this plant, (wolf's-bane,) are subject to illness, becoming at times wholly insensible; but I was inclined to think this illness arose from the quick circulation of the blood in the fatigue of ascending in a rarefied air; and this day my supposition is apparently verified, for in trying my pulse by a watch with a second hand, I found on standing still after a little bit of steep ascent, that my pulse beat at the rate of 160 in a minute. A seapoy's, (a hill man,) who was with me, beat at the rate of 172. I found also, that in walking on level ground, my pulse beat about 130. It is therefore most probable, that the great fatigue experienced in climbing ascents at this height, is owing to the increased circulation of the blood.*

N. B.—Arrived at the village of Boōrfēr, about five miles, at 4h. 40m. P. M., (forty or fifty houses) situated in an open part of the valley with numerous fields about. The valley of Mertolee† on the opposite side of the river about half way. Crossed on a *sanga* rather a large stream close below the village, the bed of it very wide, five or six punchakies‡ in the course of it.

23rd September.—Thermometer at 10 A. M. 56°, moist thermometer 41°. Early in the morning hoar frost on the ground, and a film of ice, the thickness of a shilling, on the water in the *suræe*. Night and morning beautifully clear; not the smallest speck of

* It is singular that on the 29th May 1842, I walked nearly all the distance from Doong across the Oonta Dhoora Pass, including the whole ascent and descent of the Pass unaided, without feeling any unusual fatigue. Two Booteas walked up the Pass with me; five other Booteas, a hill servant, and a Mussulman of the plains, accompanied me (on jooboos,) and no one of the party complained of, or appeared to feel unusual oppression. I recrossed the Pass, walking, on the 5th June, with exactly a similar result.—J. A. W.

Lieut. Weller is not singular in his exemption from suffering in rarefied air; as during a six years' residence in the hills, I have found that the European travellers to great heights are affected by, or free from, the painful effects of rarefaction in about equal numbers. I myself am a great sufferer. The generality of those affected find their powers of motion and muscular exertion extraordinarily paralysed. The natives do not attribute the effects indiscriminately to 'nirbisi,' or aconite—and indeed the worst oppression is felt above the reach of all vegetation. 'Bish ke howa' (The poisoned air) is the general expression for the cause of the oppression, though it is true that certain plants are often quoted as the root of the evil.—J. H. B.

† Meaning below Murtolee village.—J. A. W.

‡ Water mills.—J. H. B.

cloud visible. Marched at 11h. 30m. A. M., descended to the river over a *sanga* immediately below the village; the *sanga*, or rather the stream, was seventeen paces wide, or about forty feet; near the banks of the stream the turf was very thick and short, and delightful to walk on. About two miles came to a small village; five or six houses, (Mápari,) close to which the gooseberry was growing, of which there were two species, one with a smooth stalk, the other rough and bristly; saw no currant bushes.* The rocks, clay slate and greywacke, with a good many masses and fragments of quartz, and as I approached the village of Pāchoo, the rock became of a reddish brown clay on the weather surface, but grey in the fracture; many of the fragments contained ore in some quantity; all the fragments and masses have descended from the height above. There are two villages called Pāchoo† on either side of a large stream which comes down from the direction of

Specimens
76 to 89.

Nundee Debee,‡ and which are crossed on a small *sanga*. There are six or eight mows§ in the first, and ten or twelve in the second, (which I was told paid forty rupees a year to Bijjee Sing.) These villages|| are about three miles below Melum. Arrived at Melum at 4h. 45m. P. M., stopped a good while on the road.¶ Recrossed the Gooree immediately below Melum, which is situated in an open spot of ground of some extent on the opposite side. At about half a mile runs in a N. E. direction the Goonka, up which lies the road to the Pass; the other stream, they say, was the shortest course, being only one day's journey.

N. B.—This stream below Melum, was only thirteen paces, or about thirty-two feet across, having diminished in its breadth about eight feet. The Goonka joins it about a mile below this.

* I saw currants at Melum on the 25th May, the young fruit just out. Plants strong and flourishing.—J. A. W.

† Pachoo on the north bank is rent free in "suda-burt" tenure, for the feeding of pilgrims to Manessurouer.—J. H. B.

Gānaghur on the south, Pachoo on the north bank of Pachoo River. A fair is held here annually one day, in the rains.—J. A. W.

‡ The Peak of which appears (West) magnificently grand and near; from the north bank of Pachoo River in ascending.—J. A. W.

§ "Mowasahs," or families.—J. H. B.

|| Have a very good extent of level culturable land along the right bank of the Goree.—J. A. W.

¶ I. e. From the N. E.—J. H. B.

Since leaving Tola, nothing like a tree has been visible, and the general aspect of the country is consequently very barren. A very unpleasant strong southerly wind blew all day, and seems to be the prevailing wind here, as the open parts or fronts of the houses here have generally a northern aspect. There is a high mountain at the back of the village, which separates the two streams, which defends it perhaps from the northerly winds, and on either side the mountains descend within a quarter or half a mile, and the only opening is to the south.

The crows in this part appear to differ from the common crows; they fly in pairs, are few in number; their note resembles that of the sea-gull more than the crow,* to which in fact it bears not the slightest similitude. There are a good many of the common† blue pigeon, which fly in flocks near the villages. Saw one large snippet about half way, and passed over a good deal of swampy ground, when I expected almost to have flushed a woodcock,‡ as they are found sometimes near Almora in the winter, and descend probably from this quarter. One of our party, Mr. — purchased a sheep with five horns at the village of Boōrfēr, for two rupees and twelve annas; the owner asked one rupee per horn for it.

Plants.

1. Dwarf juniper with ripe berries, (black).—2. Ditto a few, not in flower or fruit.—3. The shrub resembling the sweet-briar in fruit.—4. The gooseberry in fruit, (two species).—5. A species of barberry with leaf, not in flower or fruit.

24th September.—Halt 8 A. M., thermometer 37°; moist thermometer 31°. Hoar frost on the ground, sun just on Milum, (fine morning.) 12h. 20m. P. M. barometer 19.900, thermometer, moist 69° thermometer, air 66° 5', moist thermometer 42°. Bare thermometer held in the hand to the rays of the sun 69°. 12h. 45m. thermometer covered with black wool and laid on the ground in the sun rose to

* This is I believe the English chough. I saw them high up in the snow, and again about 15 miles across Oonta Dhoora; some have red, some yellow feet and beaks. The plumage is very soft, and of a deep purple black.—J. A. W.

† Far more like the wood pigeon. Black and white, and grey and white plumage. But blue pigeons are also met with even higher than Melum.—J. A. W.

‡ I constantly looked for woodcock, but never flushed one. From November to March they are (some years more than others) very abundant round Almora, Petoraghur and Lohoghaur. Fifty brace have been killed in a season by one Officer.—J. A. W.

122°. A party came in from Bhote, (or Tartary,) this forenoon, bringing with them five ponies, three jubbos* and a flock of sheep. As they approached the village, a party of musicians with tom-toms went out to meet them, and serenade them in; four of the ponies had riders, the fifth led. The party has been eighteen days coming from Gurtope. They say the snow on the Pass is mid-deep.† In the afternoon strolled up the Goree, and at the distance of a mile and half, or perhaps a little more, saw the snow-bed whence issues the Goree; it has a large high bank with a complete earthy appearance, which stretches across the valley from one range of mountains to the other, (some hundred feet,) and the river (the people say) is not seen above this; but at the distance of perhaps about four or five miles, there is a small pool of dark water which is very deep, and where the people sometimes resort to bathe, (as a religious act.) One man who accompanied me in my walk had bathed in it, but did not go deeper than his middle. To this pool of water, of forty or fifty haths or cubits in extent, the bed of snow continues uninterrupted, with an unequal surface, having numerous undulations. No water is visible beyond the pool above mentioned. There is a very small stream 2 or 300 yards on this side the snow-bed on the right bank of the river, to which the snow-bed

* The cross breed of the Thihet yak and Hill cow, pronounced jooboos.—J. H. B.

† *Extract from Lieut. Weller's Journal, May 25th, 1842.*—"I went to see the source of the Goree River, about a mile N. W. from Milum. The river comes out in a small but impetuous stream, at the foot of apparently a mass of dirt and gravel, some 300 feet high, shaped like a half moon. This is in reality a mass of dark coloured ice, (bottle green colour,) extending Westward to a great distance, and covered with stones and fragments of rock, which in fact form a succession of small hills. I went along this scene of desolation for a long space, but could not nearly reach the end. Here and there were circular and irregularly-shaped craters (as it were) from 50 to 500 feet diameter at top, and some of them 150 feet deep. The ice was frequently visible on the sides; and at the bottom was a dirty sea-green coloured pool of water apparently very deep. Into one of these craters I rolled down numerous large stones from off the edge, and in a few seconds huge masses of ice rose from below, seemingly detached by the agitation of the water. The bases of the hills on either side, and frequently far up their faces, are one succession of landslips, but from their distance I do not believe it possible that the debris in the centre of the snow-bed valley can have fallen there from the side hills. *Query?* May not a separate hill at some remote time, have been gradually reduced by landslips, the Goree River and torrents in the rains carrying down the fallen earth and stones, and reducing the mass to what we now see? Nagoo Boorha tells me, that his father (who lived to 98 years) remembered the source of the Goree nearly opposite Milum, and Nagoo himself has seen the recession of the snow-bed some 3 or 400 yards in the course of 40 years."

reached in the memory of some of the oldest men of the village, but it has gradually broken away, which may perhaps indicate some amelioration of the temperature in this quarter.—The river runs past Milum in a N. W.* direction, and towards the snow-bed nearly North.†

The man who came in from Gurtope, wore round his neck a pair of goggles,‡ made apparently of black horse hair, worn when crossing over snow. For the coarse broad cloth which is carried to the fair at Gurtope, they say they receive generally 25 rupees for the length of two breadths, which ought to be about 3 yards; allowing the cloth, which is generally the case, to be $1\frac{1}{2}$ yard wide, little more than 8 rupees per yard; but it must be of the coarsest kind, and such perhaps as is sold in Calcutta for 3 rupees per yard. The bones§ which are brought by the Bhoteahs for sale at the fair held at Bageswur, it appears they purchase at Gurtope, and consequently they are not found amongst the Himalaya, which had formerly given an interest to these productions, but which must now, if the above account prove true, cease altogether.

25th September.—Halt; employed in getting a lesson from Herbert in the use of the theodolite, and in preparing for our visit to the Oonta Dhura Pass. Herbert and Cole too unwell to accompany Conway and myself. Procured our bottle of gooseberries, which I boiled in the hopes of preserving them.

26th September.—Marched at 11h. 20m. A. M. Our own coolies having refused to proceed with us to the foot of the Pass, procured people and jubbos from the village. Our people were frightened I imagine at the exaggerated account of the Bhoteahs regarding the snow.

Crossing the Goonka on a *sanga* opposite Milum about a quarter mile distant; it is about the same breadth as the Gooree, but the body

* i. e. From the N. W.—J. H. B.

† From the North.—J. H. B.

‡ These horse hair goggles are far more cool, and they more protect the eye from the effects of snow-glare, than green or blue glass spectacles, or wire goggles.—J. H. B.

§ Fossil bones, *Bijlee ke Hâr*, nearly always procurable in the Almora bazaar, and used as medicine! I am told, in a pounded state. I have rarely been able to obtain teeth or other characteristic specimens. The bones are chiefly those of ruminants, and are found in the hills immediately adjacent to the Suttlej, in the first part of its course through Thibet. The village of *Doompoo* is one chief site.—J. H. B.

of water appears greater; the level ground on which Milum stands, seems to be made up from the crumbled fragments of the neighbouring mountains; as the steep bank of about 150 feet, down which we descended to the Goonka, is composed of a large quantity of earth, in which are imbedded both rounded and irregular stones.

Ascended the river on its left bank, road passable, but not very good, the footing in some places very bad; no grass, nothing but loose earth and small masses of rock. Clay slate and grey silicious rock* in masses and fragments; the general appearance of the mountains extremely barren, precipitous, and shattered, the dip not procurable. The river in three or four places on either side is bounded by masses of earth and stones, (which are no doubt the debris of the overhanging mountains,) which rise in numerous places in sharp peaks, and are, in miniature, the resemblance of some of the more lofty points. Lying in the bed and sides of the river, are some huge masses of breccia or conglomerate.† The rock has not that general metallic appearance it assumed the two preceding marches, but I picked up some specimens with pyrites, some crystals (apparently dodecahedrons.) At about two miles from Milum, saw a few stunted birch trees.

At 2h. 28m. P. M. arrived at our ground of encampment at the mouth of a stream which runs nearly due East, called the ————? The general direction of the Goonka is from N. E., but inclining in its windings more from the North than from the East; from this however it comes from a due North direction for some distance. There are near this a few withered looking birch trees, and on the opposite side some dwarf juniper; but the general look of the country is extremely bleak and barren. The Bhoteeas who accompany us, are sleeping in the open air (with fires,) having brought no tent with them, and the *cave* being occupied by the few servants we have brought with us. The thermometer at sunset was 47°,

* A sandstone.—J. H. B.

† During a fall of snow or a thaw, the descent of stones is almost constant from the earthy precipices over head, and the whole of the Goonka glen at such times is a very dangerous route. Rain is never violent here, but whenever any falls, down come avalanches of stones. Some of the latter (as in Manson's sketch) are suspended on the top of the ravine precipices on little pointed peaks, and their appearance on an avalanche day is any thing but pleasant to the traveller underneath. See Sketch No. 4.—J. H. B.

and a very cold wind blowing, which has been the case from the time we marched; which, added to the glare from a light colored soil and clouded sky, made the march very unpleasant.

Beyond this, they say there is no firewood procurable, and that we must carry from this what we may require. The distance of to-day's march is, I should suppose, about five miles.*

We fell in with a party who were returning with borax, who said the snow in the Pass was not more than enough to cover the shoe, instead of covering half the body. The Bhoteeas with us also begin to say the ascent is very easy the greater part of the way, it being only steep towards the top, and that it is not so steep as the one we crossed between the Ráalim and Tola. They gave us a very different account when at Melum, thinking no doubt to deter us from visiting it.

27th September.—7h. 45m. A. M. ther. 41°, moist ther. 32°. Marched 9h. 10m. A. M., and reached our new ground at 12h. 33m. A. M.

Specimens 91 to 103. distance about six miles. Found some clay slate with varieties, and beds of harder rocks. The road continued along the left bank of the river, the (downward) course of which varied from N. E. to N., the general direction of the river from Melum to the Doong cave close to the junction of two streams, (one called the Ootah, E. from the Pass, which comes down from the N. W.; the other Lusser river, which seems to vary from the N. E. to the East,) is about N. N. E. The fall of the stream to-day is much greater than yesterday; saw the juniper growing a little beyond our old encampment; but soon lost all signs of vegetation, excepting when we approached the junction of the two streams, when we came to one or two open spots, † where the ground was pretty well clothed with a

* An ordinary march for a party with loaded sheep is five miles per day in the Passes, and eight or ten miles in the easier ground in Thibet.—J. H. B.

† Called "Mulla" and "Tulla" (upper and lower) "Sulong." The Booteas generally halt here either for the day, or for a few hours.—J. A. W.

Near this, I found on my way up to Doong in May 1841, in *situ*, a specimen of siliceous sandstone intersected by a vein of crystalline carbonate of lime, containing impressions of bivalve shells. As far as I can judge, the shells are terebratulæ, similar to some found by Gerrard in Chinese Tartary beyond Kunawur. This ground will be re-examined with care. Capt. Boys, 6th Cavalry, recently discovered on the range South-east of Mularee in the Neetee Pass, beautiful specimens also *in situ*, of shells, (either *Avicula* or *Pecten*) in secondary limestone. Both Doong in the Juwahir Pass and Mularee in the Neetee Pass, are considerably on the south side of the Boundary Pass. In 1837, (Vide Asiatic Society's Journal, 1838,) I stated my confident belief, that

short grass, and two species of moss (new to me) here and there under the lee of a rock.

Having been told by a man of Almorah, a Brahmin, in the morning, who had descended the Pass the day previous, that it was not more than two hours' ascent, and being anxious to return to our two sick companions at Melum, in spite of what the people who were with us said (having been deceived by them before,) we set off with the intention, if possible, of reaching far enough at all events to see where the Pass was, as we were told it was visible a little further on; but after ascending for one half hour, and no signs of its appearing, we returned much fatigued. The jubboos we had with us were unable to carry us. We slept under the *oodear*, there being no spot on which to pitch our tent; the night was very cold. The party we saw this morning, had been only ten days from Gartope, two of which they had halted. They had with them sheep laden with salt and borax, five or six ponies, and some jubboos.

28th September.—Time 5 A. M. ther. 37°, moist ther. 32°, very cold. Soon after sunset last night, thick clouds collected all round the surrounding heights, which did not disperse till the sun rose this morning.

Marched at 9h. 25m. A. M. and commenced the ascent, crossing the river over a bridge of stones, which were piled on nearly a natural bridge of rocks; at about half a mile, came to a huge bed of snow, from whence the river issued, being I suppose about twelve feet wide; the snow-bed I should think 300 feet thick, covered with fragments of rock from the neighbouring mountain. The road, if it can be so called, very bad, and in many places the footing very insecure; this snow-bed continues for about half a mile or perhaps a little more; it has numerous fissures in it, and from the edges many large icicles, three feet long, were hanging in some places. It had a regular stratified appearance, and dipped to the S. W., just the reverse of the neighbouring mountains. Now and then the stillness of the scene was disturbed by the

fossils would be found on the hither side of the Passes, in the tract of country which lies north of the Himalayan granite peaks, and the gneiss and mica slate strata; but south of Thibet, its rocks being apparently of the same secondary character as that of the oolitic (?) series in Europe, and being quite different from the great primary chain of the Himalayan peaks, the central mountains, and the tertiary strata (so rich in terrestrial fossils) of the Sub-Himalayan Ranges.—J. H. B.

falling of small fragments of rock, dislodged by the melting of the snow. After completing the ascent of the snow-bed,* saw the stream flowing over a small valley at a very placid rate, and entering the snow-bed at a similar opening to the one where it has its exit. The road continued along the base of the mountain on the left bank, all the mountains on the opposite side, being the north-face, were covered with snow to their base, as well as those at the head of the small valley which had beds of snow in the hollows, or rather glens, and from one of them the river appeared to take its course. The road continued in this direction N. W., very good for a mile and a half with very little ascent, we then turned to the N., and commenced rather a steep ascent over a mass of white siliceous rock, the debris of the mountain above. On reaching the summit, we came to another rather level piece of ground, but covered with large fragments of a darker rock and a blacker soil. We then had another ascent over the same kind of rock and soil, and on reaching the top came in sight of the Pass. A little further on, crossed two snow-beds; one, the 1st, from two to three hundred yards; the 2d, not more than sixty or seventy yards wide; it appeared in some places to be fresh snow. After crossing these, the last ascent to the Pass presented itself, and appeared easy enough, being quite free from any snow; but owing to our present elevation, we found the difficulty of ascent so great, that we were obliged to have recourse to the jaded jubbos; but finding mine quite unable to carry me up, I dismounted and made another attempt to ascend on foot, but had not taken more than six paces, before I found myself quite unable to proceed from excessive weakness in the limbs and loins. I therefore made the guide,

* At or near this point on the 28th May 1841, my own further progress to the Pass was rendered quite impossible from the depth and softness of the snow, which was falling heavily in a thick mist. It was not without great difficulty, and some danger that I got back to Doong on a jooboo's back. There also the snow was so heavy, and the appearance of the atmosphere so threatening, that the Bhooteeahs recommended an immediate flight to Milum, Doong being a very dangerous place for avalanches, and the road to Milum likely to become more and more unsafe every moment. I accordingly moved, and my whole party arrived the same day safe, but in a miserable plight, at Milum. On the 29th May 1842, Lieut. Weller found the whole route almost entirely bare of snow, and he was able to penetrate more than twelve miles beyond Oonta Dhoora to Bulcha Ghat, without difficulty. The last winter was very mild in the Himalaya, and the usual bad weather in the spring months was quite absent. In general, June and not May, is the earliest month for the opening of the Passes.—
J. H. B.

who was with me, tie a cloth round under my arms, and then fastened it to the jubbou's tail, by which means I ascended to the steepest part with very tolerable fatigue, and was relieved from that insupportable weariness of the limbs.

From the top of the Pass ran a small stream of water.* Long before we reached this part of our journey, all signs of vegetation had disappeared, and here the mountain was covered with small fragments of rock, clay slate, &c. The strata of the heights to the right and left of the ascent were very much contorted in all directions. We were one hour and twenty-five minutes in accomplishing this last ascent, which we afterwards descended in twenty-five minutes.†

On reaching the summit of the Pass,‡ an immense sea of mountains lay before us, gradually diminishing in size from the N. W. to the North, in which latter direction our guide told us lay Gertope, to which place two roads led, the nearest one, by which two other ranges were to be crossed by Khylas, the other by Doompoo, by which only one other range, in fact a continuation of the range on which the Pass is situated, was to be crossed. The people, with their sheep laden, cross these ranges in one day. The mountains to the N. W. were partially covered with snow, (and the Pass on the northern face completely

* On 29th May last, nearly the entire side of the Pass had water trickling down it.—J. A. W.

† On the 29th May last, I walked up it with ease in one hour and fifteen minutes.—J. A. W.

‡ This account as to routes and general geography is based on incorrect information. Moreover, from Oonta Dhoora no view is obtainable into Thibet, though this Pass has been usually considered the frontier of the two countries. The range visible to the North from Oonta Dhoora is Bulcha, the real termination of the Cis-Sutlej, Himalaya and the sea of mountains visible to the North-west is within, i. e. Southward of, the prolongation of the above mentioned Bulcha range to the Westward. Whenever the water from the Northern slopes of the Himalaya flows into the valley, (or rather series of plateaus divided by ravines,) through which the Sutlej takes its early course, the last range of the Himalaya may be said to be passed. Whenever, as at Neelung, beyond Ganguotree and Topeedoonga and Lufkel, beyond Oonta Dhoora, (the Juwahir Pass,) the streams rising even on the North face eventually flow Southward, and join the great Cis-Himalayan rivers, that country is properly, (i. e. geographically, not geologically) within the Himalaya chain, whatever elevation may have been crossed to reach it, and, however, nominally the said chain may have previously terminated in a political frontier. Compare with Captain Manson's account that now appended from the Journal of Lieutenant Weller, Engineers, and my own observations from the crest of the Neetee Pass, published in the Asiatic Society's Journal of 1838.—J. H. B.

so and very steep,) but it gradually disappeared to the N. E. and the mountains diminished in size. No sign of vegetation was visible in any direction even with the help of a telescope.

There is a road leads from this Pass to the westward to Neetee, which, according to our account, is four days; and towards three days' journey at each alternate stage, there is a village.*

The summit of the Pass is very rounded, and in some places the strata of clay slate crops in nearly a vertical position, but dipping a little to the W. S. W. Many, indeed almost all the fragments of rock up the ascent, were very much intersected with veins of felspar.

To the Westward, were seen some very lofty snow peaks, but none were visible which were known to any of the people; which added to the circumstance of the collection of numerous thick clouds about, and the want of time, prevented my taking the bearings of any of them. There was a sharp piercing wind blowing from the South, and not the slightest shelter procurable, and it was with some difficulty that I set up the barometer, my hands being benumbed with the cold. The height of the Pass is about 17,500 feet. The barometer and thermometer being as follows:—

Time 3h. 10m. P. M., barometer 15.550, temp. of air 34°, temp. of mercury 39°, moist ther. 32°, the water freezing immediately it was exposed to the air. The thermometer covered with black wool laid on the ground, sheltered pretty well from the wind, and exposed to the sun's rays, only rose to 64°. During the greater part of the ascent my pulse did not rise above 150°, the last part of the ascent I did not time the beats. We were five hours in ascending, remained on the top about 1h. 20m., and accomplished the descent in two and half hours; the first part of the descent, about four miles, we came down in an hour, which in ascending had occupied us three, of which we halted about ten minutes near the foot of the last ascent. The jubbos we had with us, we found had had little or no food the two preceding days, which prevented their being of that use they might have been, for they are certainly fine animals for such a country, and are very sure footed. Soon after we commenced our descent, snow began to fall, but fortunately not in any quantity, although the clouds were dark and

* No names given to halting places.—J. A. W.

threatening, and we reached our quarters under the rocks at 6h. 20m. P. M., after an absence of about nine hours. Near this *oodear* on the opposite side of the river, we were told that about eight or nine years ago in this same month, two parties of Bhoteeas, with 200 or 300 sheep coming from Tartary were lost in a snow storm, and that at this season snow constantly falls; but they say there has been very little snow the last two years.

N. B. Learnt that the fossil bones* which are brought by the Bhoteeas for sale at Bageswur, are not found in the Himalaya, but purchased by them at Gertope. Neither are the Saligrams† found among them, but are brought from the same place. On our return towards Munsaree, picked up specimens of the latter, and some quartz crystals on the top of the peaks above Saeru, which had been left as offerings by travellers, and which may possibly account for those found in a Pass to the westward by the Gerards.

29th September.—At the Doong *oodear*, time 10h. 35m. A. M., barometer 18.190, temp. of air 44° 5', mercury 45°, moist ther. 34°.

N. B. Water boiled at 185° of Far. Marched at about 11h. 20m. A. M., and reached Milum a little before 6 P. M., but stopped for some time on the road, sketching and picking up specimens, the road nearly one continued descent, and on numerous places the footing very precarious; the descent being much more difficult than the ascent in that respect, but of course not nearly so fatiguing. Found our invalids very little improved, and very anxious to leave Milum, and resolved marching back towards Munsaree the following day.

30th September.—Milum. Marched 12 A. M., and arrived at the village of ——— about 6 P. M., but loitered a good deal on the road; the road pretty good, excepting immediately below Pachoo, when after crossing a small *sanga* over a stream which comes down from the direction of Nundee Debee, there is a very difficult steep ascent for some hundred feet, composed of earth and

* In regard to the fossil bones, this observation is quite correct, but not so in regard to the shells.

† Vide preceding geological note.—Ammonites are plentiful, and were found by me three miles beyond the Neetee Pass, with their usual accompaniment of belemnites. Lieutenant Weller found at Lufkel, beyond the Juwahir Pass, vast quantities of these fossils, all in situ in black clay slate with limestone.—J. H. B.

stones. In one part, observed signs of stratification, and on examining it closely, found it consisted of fine earth, alternating with beds of small gravel, but quite safe.

Found fragments of granite* and gneiss in the bed of the stream. The general formation to-day continues to be clay slate. Purchased several fine Tartar sheep for one rupee eight annas to one rupee twelve annas each; they are beautiful animals, and have very fine wool.

1st October.—Marched at 12 A. M. and arrived at Luspa at 3h. 20m.

Specimens 111 and 112. P. M., road very indifferent. Formation, clay slate as we approached Luspa. There was a very steep ascent from the river, the width of which is very much increased, as I could not throw a stone across it. A little before we came to Luspa, the road passed under some very lofty and precipitous rocks, a perfect wall for some distance, where a slip had occurred about four years ago; the footing in some places rather bad. A little beyond this, came suddenly on a fine open space or valley, up which, at about half a mile, is situated the village of Luspa on a rising piece of ground.

Vegetation† has been rapidly increasing every step we took from the village of Reelkote, and the whole face of the country is losing the barren and naked appearance of the upper part of the valley.

2d October.—Ther. 9° 45', barometer 20.035, air 55°, moist ther. 46°. Marched at 12 A. M., arrived at Bodar, (on the right bank of the Gooree, no valley); at 5h. 50m. P. M. moved very slowly, distance from ten to eleven miles, road execrable, crossed the river twice, once over a large *sanga*, and recrossed over four small ones, more like ladders thrown

* The higher peaks hereabouts are all of granite and gneiss; soon after, below Luspa, these rocks become the exclusive formation, and the Tartaric series are left behind.—J. H. B.

† Nothing can be more striking than the passage from the extreme barrenness of the upper Passes to the gorgeous vegetation of the lower, where first the birch and dwarf rhododendron, then the ragha firs and yews, then sycamores, horse chesnuts, oaks, alders, box, &c., and then all these intermixed with the most rich under-wood and innumerable flowers in turn delight the eye. To a Thibetan all these things are novelties, a willow being the only tree larger than a juniper bush, which he has ever seen. The Lama of Toling, when a refugee at *Almora*, where the country is bleak from want of trees, though fertile, said, "Ah! *this* is a proper country like my own. The tree forests between this and the Snowy Pass are very *bad* indeed, and spoil the scenery!"—J. H. B.

from rock to rock, where the river has a very great fall a little below a very lofty precipice, and where the whole mountain forms a complete wall from the summit to its base, which is washed by the stream: besides the ladders across the stream, there were several others along the road, which would have been impassable without them. Passed snowbeds, one with a very singular appearance, having a complete archway through which a stream passed which fell from a great height over a steep precipice immediately behind it; the front part of the arch had melted away. Below Luspa, about a mile near the bed of the Gooree, large blocks of granite. Formation to Boodur, gneiss with granite veins.

3rd October.—9h. 45m. A. M. barometer 22.545, air 64°. mercury 65° 5', moist ther. 57°. Marched at 11h. 20m. A. M. Arrived at Rārra at 3h. 45m. P. M., stopped about an hour or so on the road to sketch; road very bad over rocks and ladders. General direction of river, N. Gneiss the whole way, no granite blocks beyond the commencement of the march. Trees of various kinds growing, day warm, found white pantaloons pleasant. Rārra* lies about half an hour's ascent up the mountain after crossing a small torrent over a *sanga*, which comes from the West, and which has a precipitous fall. The fall† of the Gooree is also great, and I regret I was unable to ascertain the fall from Boodur, owing to the man with the barometer having preceded me some distance.

Passed numerous parties of Bhoteeahs on their road to Munsaree, with sheep and goats laden with salt and borax. They were halted near this, and started about the middle of the night, and kept up such an incessant noise, as to keep me awake nearly all night.‡ Heavy showers of rain fell during the evening, and early part of this night. Formation gneiss.

4th October.—Fine morning and cold wind blowing; 8 A. M. ther.

* The waterfalls up the Rarra glen are some of the grandest in the hills.—J. H. B.

† Near Boodur, or more properly Bugdoar, the fall of the Gooree is tremendous, in some spots at the rate of not less than 800 feet per mile. The Aluknunda in some parts of the road to Buddrinath has an ascertained fall of 650 feet in a mile, and the descent of the Mundakinee river, below Kedarnath, is one continuous cataract for about two miles. Such are the Himalayan torrents.—J. H. B.

‡ The sheep and goats cannot travel in the day time after the sun becomes hot; hence these night marches.—J. H. B.

54° 5'. Marched at 10h 18m. A. M. Arrived at the top of the Pass* at 11h. 12m. A. M. ascent tolerably easy, but slippery in many places, in consequence of the rain and the flocks of sheep which had Passed over it; ascended the whole without being obliged to stop to take breath. Pulse never exceeding 140 in a minute, nor the number of inspirations 32 ther., 11h. 30m. A. M. barometer 21.645, air 62° 5', mercury 64°, moist ther. 57°.

A very little below the Pass, tried the heating power of the sun on the thermometer exposed from 12 A. M. to 12h. 15m. P. M., the one with the black wool rose to 125°, the plain one without it to 95°; they were laid on a book with red leather cover, the bulbs being about an inch above it, sheltered from the little air that was stirring by two tin boxes, the sun shining on one, by which of course some heat was reflected on the thermometers. A slight cloud passed over, which put a stop to the experiment; however, they rose very little the last five minutes. Arrived at our old encamping ground on the bank of the Saëen, near its junction with the Gooree, at 3h. 45m. P. M., descent very long and tedious, the first part very steep† down numerous flights of steps; the road lying in many places just round the brow of the mountain, overhanging the stream below. The whole road composed of gneiss, little or no granite observed. Numerous and various trees growing on the northern face of the mountain, the point to which the strata dip.

Passed numerous parties of Bhoteas halted on the road, either on their way to, or returning from Milum, mostly the former, their sheep laden with grain. Our party had received for the salt they carried down four measures of *dhan*, (rice in the husk,) for one of salt and two of wheat.

* Hurdol or Leepoo-ke-than.—J. H. B.

† The Hurdol Pass separates Upper or Mulla, from Lower or Tulla, Juwahir, and is the most difficult mountain to cross which I have ever seen. The banks of the Gooree are so steep, that the road cannot keep near the river, and this Pass becomes unavoidable. To a person ascending from the South, while loaded sheep are descending the steps, the danger of being 'extinguished' by the fall of a rock on his head, is imminent. A pony belonging to one of my party, being alarmed by the sheep, started and fell over the precipice, and was dashed to pieces. It took a man one hour and a half to walk down to the spot where the poor animal lay! The man went for the saddle, but the article had no longer form, and scarcely material, and his labor was lost.—J. H. B.

Picked up on the top of the Pass various specimens of Saligrams, which had been left as offerings by the Bhoteeas and others on their way to and fro. A little rain fell in the afternoon, and it continued very cloudy the whole evening. Fell in with a party from the neighbourhood of Loah Thull, carrying up grain, &c. for sale. They say they receive a measure of salt for one of rice. On enquiring of two Bhoteea lads of the village of Luspa, who were with me, learnt that the usual rate of exchange throughout all the villages in Upper Jowahir, (or Bhote as some call it,) is one measure (or quoin) of rice, two of wheat, three of attah, and three of barley for one of salt. Now we purchased the latter articles at the rate of sixteen seers of eighty-four sicca weight for one rupee.

5th October.—Marched at 7h. 10m. A. M., and arrived at the village of Jult, the residence of the Bhoteeas in Milum in Munsaree; the ascent from the river is very steep and rocky, and not rideable for more than a few hundred yards. Arrived at the village at 10h. 15m. A. M. It contains some of the best houses I have seen,* much superior to those at Milum, or in any of the villages in Upper Jowahir. The people here when we were encamped at Kantee, about one and half mile off on our way up, refused to give us any supplies or coolees, and said they would not obey a dozen purwanahs of the Judge's, should he send them, which was the cause of our now encamping at this village, which is somewhat out of our way. The day since noon has been cloudy, and some heavy showers of rain have fallen. Passed within the distance of a mile this morning about 700 sheep and goats on their way to Milum, and I suppose as many more passed me before I commenced counting. The sheep used for carriage are bred in Dhanpoor and Gurhwal, and are small. The large Tartar sheep is not so employed, not being capable, I imagine, of bearing the heat; for I have observed that a flock of these sheep we have with me, during the last two days, appear to suffer very much from the change of temperature.

6th October.—(Jult.) A halt, time 11h. 35m. A. M., barometer 24.065, air 72°, mercury 72°, moist ther. 63°.

* Jult, Gorpata, Looing, Duratee, &c. contain not only the best houses in Jowahir, but excel in size and appearance the greater part of the Almorah houses, and are decidedly the most substantial and handsome villages in the whole hills from the Sutlej to the Kalee. The wood-work and the masonry are both admirably carved in the principal houses.—J. H. B.

| | | | |
|----------------------|--------|-------------|------|
| 1h. 15m. P. M. ther. | 74° 5' | moist ther. | 64°. |
| 3h. 50m. „ „ | 73° | „ | 64°. |
| 5h. 50m. „ „ | 70° 5' | „ | 62°. |

7th October.—Marched at 7h. 40m. A. M., breakfasted about two-thirds up the ascent, and reached the Kalee Moondee Pass in forty minutes from thence, in all two and half hours from Jult. Kalee Moondee Pass, time 1h. 30m. P. M., barometer 21.725, air 70°, mercury 81° 5', ther. moistened with milk, (no water procurable,) 63°, ther. (black wool) in the sun 123° 5'; reached our tents in one and a quarter of an hour from the Pass, pitched near a beautiful waterfall,* at the foot of which was a fine pool of water beautifully clear and deep enough to bathe and swim in, the centre of it being upwards of six feet deep; jungle very thick the whole way down the descent. Observed a new variety of pitcher plant; in all I have seen on the range six varieties, one yellow, one large white, one small ditto, one large pink, one small ditto spotted, and one blue.

On approaching the Pass, the rock changed from gneiss to mica slate, which rock continued some way down, and it then changed to gneiss with beds of white talc slate. Ther. 60° at about 6h. 30m. P. M., evening cold, dew beginning to fall; a few clouds, no shelter for our servants and coolies. Observed the raspberry plant, (the one with runners) near the waterfall, and the blue cowslip† or oxlip growing without the usual long footstalk.

8th October.—6 A. M. ther. 51° 5'. Marched at 6h. 50m. A. M., and reached the top of the ascent in forty minutes; road very bad, unable to ride over any part of it. Gneiss white talc slate, and at the summit mica slate. A little on the descent, gneiss again; descent very steep, and road bad. Arrived at the village of Gheergaon in one hour and fifty-five minutes, whole distance completed in two and three-quarters of an hour; several small villages in this neighbourhood. This Pass‡ is somewhat higher than the one we crossed yesterday.

9th October.—Fine morning. Marched 7h. 8m. A. M., arrived at Kantee, (the cypress village,) at 9h. 30m., on the road 2h. 20m.,

* Ayar Panee.—J. H. B.

† *Primula purpurea*.

‡ Called Betoola Ghatee.

15th October.—Marched at 6h. 50m. A. M., and arrived at Jak-by-toolee at 9h. 20m. A. M. To the foot of the ascent is nearly four miles, we were rather more than a half an hour in reaching the top of it, without halting, the descent occupied about half an hour also; marched at one o'clock, and arrived at Almora at 4h. 20m. P. M. Distance from Jak-by-toolee between ten and eleven miles; total distance to Sattralee from sixteen to seventeen miles, but road good from the top of Kalee Muth* to our house, one hour and twenty-five minutes, distance full five miles.

* The high peak at the Northern extremity of the Almora ridge.

On the Wool of the Bactrian, or two-humped Camel, (CAMELUS BACTRIANUS,) being a Copy of an unpublished Paper forwarded to the Royal Asiatic Society of London. By Capt. THOMAS HUTTON.

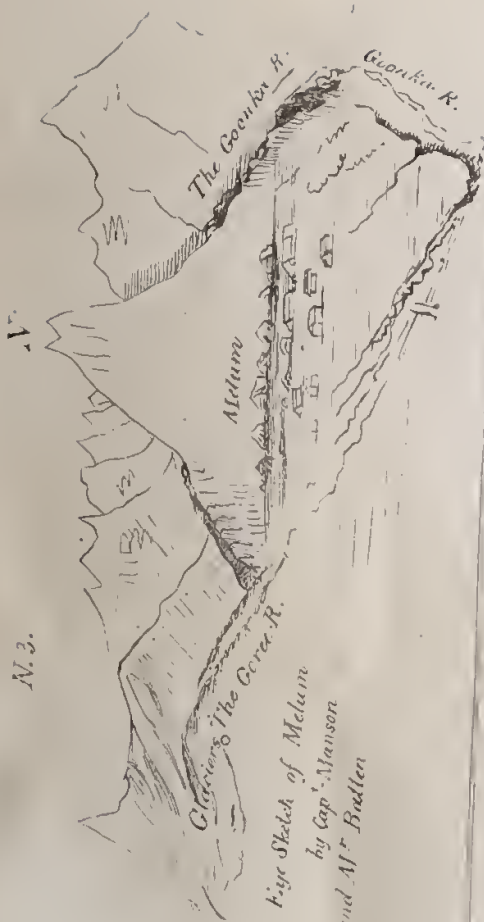
SIR,—Having lately seen a letter from Captain Arthur Conolly, regarding some specimens of wools obtained in Armenia and Koordistan, I do myself the honour to transmit samples of the “hair and wool procurable from the two-humped, or Bactrian Camel.”*

The animal is so thickly clothed during winter with this wool, and its quality appears to me so much superior to most of those shewn to me by Captain Conolly, that I should expect the article, if imported, to form a valuable commodity in the European markets. Of this, however, you will be better able to judge than I am.

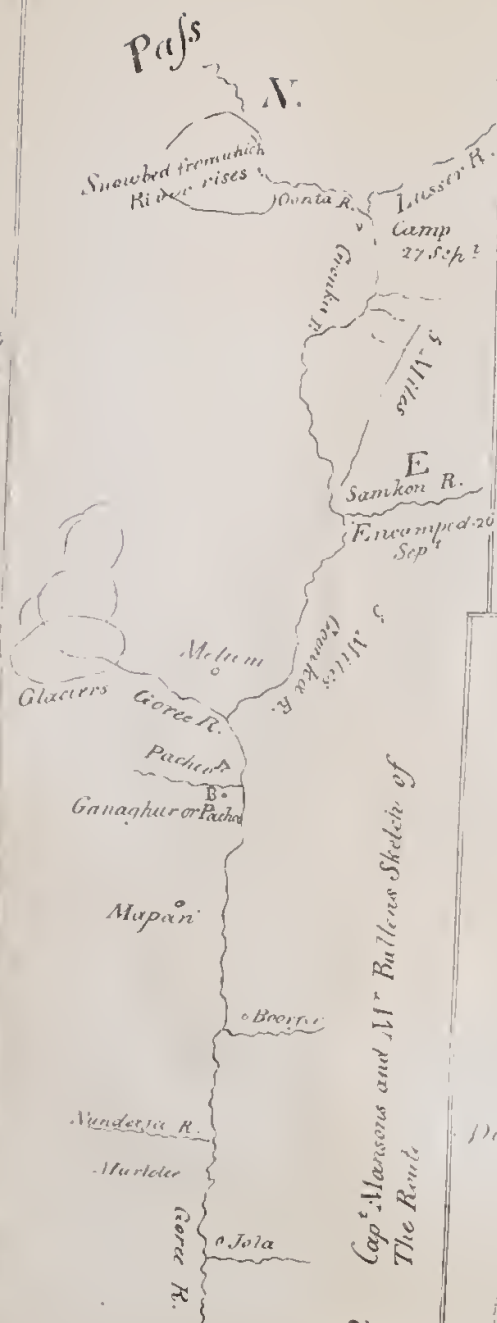
I shall do myself the pleasure to preface my remarks on this article, by a few observations on the animal from which it is obtained.

“The Bactrian Camel,” as it is termed, is an inhabitant of the Kuzzack country among the Steppes of Tartary, beyond Bokhara, which, judging from the thick warm coat provided by nature for the animal’s protection and comfort, must be subject to great severity of climate during the winter season. At Candahar, the animal sometimes arrives with kafilahs of merchants, and is termed “Bagdad-i,” *i. e.* “of” or “from Bagdad,” but on enquiry I find, that it does not occur

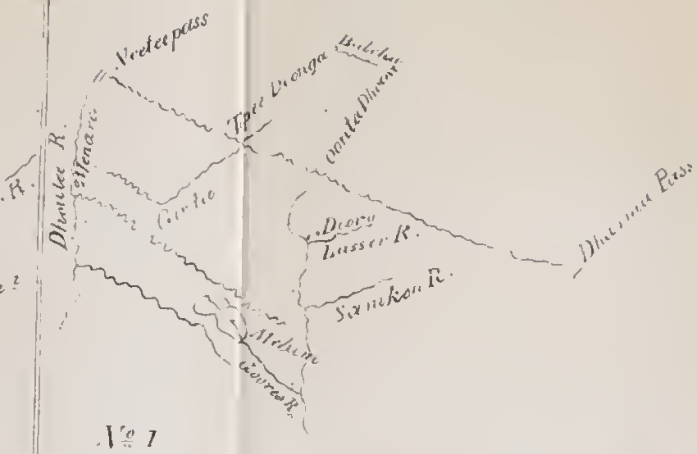
* Specimens of this wool are in the Museum of the Asiatic Society of Bengal.—ED.



N. 3. Fine Sketch of Melum
by Cap. Mansson
and Mr. Bullen



N. 2. Cap. Mansson and Mr. Bullen's Sketch of
The Road



N. 1. Sketch by Lieut. Weller of the
Country and passes from Melum
to Oonta Dhora and Bulchu



N. 4. Stones on Peaks in the Gornkaalen
Cap. Mansson's Sketch

at that place, the name having been applied to the species in former times, when Kuzzack was a *dependency* of Bagdad.

They are said to be numerous in their own proper country, and not uncommon even in Bokhara, where they are crossed with the Dromedary, (*Camelus Dromedarius*,) and produce the (Hybrid) Bokhara camel, an animal possessing enormous muscular power.

This cross varies in appearance according to the species of the dam; if she be a true camel, (*Camelus Bactrianus*, female,) then the produce partakes in its physiognomy, in a great degree of the camel, possessing a peculiar mildness in its expression, and a fineness in its general proportions. The head is of a light, blood make, with long hair upon the crown, nape, and along the fore part of the neck and throat, from the chin to the chest; also rather long and curly upon the fore arm; the tail too preserves more of the characters which are observable in the Camel, having the longitudinal line of hairs down the centre, which in the Dromedary are always wanting.

On the other hand, if the dam be a Dromedary, (*Camelus Dromedarius*, female,) the produce partakes more of the characters of that species than of those which distinguish the two-humped Camel. The hair is scarcely more elongated than the Dromedary, and is nearly of the same quality; but the animal is enormously powerful of limb and carcase, and well calculated to perform long and fatiguing journeys through the hilly tracts between Bokhara, Herat, and Cabul.

The hump, in the cross-breed, is subject to great variation; sometimes appearing in the form of one long prominent ridge, covering the back from the withers to the loins, with a wide notch or depression in the centre, serving to mark the partial transition from the *two*, to the *one* humped species, or shewing that the space which intervenes between the humps of the true camel, is nearly filled up and obliterated by the intervention of the hump of the Dromedary.

At other times, there is to all appearance but one hump, situated far back upon the loins, like the posterior hump of the Bactrian Camel; but a closer inspection, and the application of the hand shews, that the portion of the back lying between this hump and the withers, although apparently entire, and not all prominently raised, is nevertheless divided, sometimes in *one*, sometimes in *two* places, sufficiently separated to admit of the thickness of the open hand being placed

between them. These openings (or *cracks* they might almost be termed) are ordinarily concealed, except to touch, beneath the hair.

Such a formation is awkward, as the weight is necessarily thrown so much to the rear, that the animal's loins and sides are generally dreadfully galled by the constant swinging or rubbing motion of the load.

The cross-breed is termed "Boghdi."

This Hybrid Camel is in much repute among the northern tribes, and furnishes them at all seasons with an invaluable beast of burthen in a climate where neither one nor the other of the true species could be made available throughout the year. Art may be said therefore to have furnished what nature has denied them. The two-humped camel is said to be so impatient of heat, that it cannot endure the summer warmth even of so northerly a country as Bokhara, and this I can readily give credence to, since I had lately an opportunity of watching the habits of one of these animals which I purchased at Candahar. No sooner did the sun (even in *December* and *January*) fall upon the side of the yard where this animal usually stood to feed, than he walked over to the shade of the opposite buildings, as if conscious that his woolly coat was not adapted for summer weather.

During the warm months, therefore, the Bactrian Camel would not properly be available in more favoured climates than its own, and during that season, the Bokhara people would be deprived of their "Desert ships."

Again, the Dromedary, or one-humped male, can on the other hand endure but a moderate degree of cold, and the northern tribes would thus for many months be deprived of its services.

To obviate these evils, they have crossed the breeds, and obtained an animal capable of enduring alike the heats of summer, and the cold of winter. His limbs are large and powerful, his chest broad and ample, his shoulder strong and heavy, to bear the jolts and shaking he experiences in ascending and descending the rugged mountain passes and defiles, through which, heavily laden, he is doomed to travel for long and fatiguing marches.

No beast could be better adapted for the work he has to perform, or the climates he has to endure, for in him are united the perfections and capabilities of both species. His constitution derived from both,

enables him alike to undergo the rigors of a northern clime, and the heats of the southern districts, to which he travels.

It is reported of the two-humped Camel, that his hardihood is such, that the winter is the season when the trade between Turkistan and Russia is carried on, and that season is selected, because then the rivers which intervene between the two countries are frozen up by the severity of the frosts, and the camels are thus enabled to pass over on the ice.

The wool of this animal is as yet but little used, a small quantity only being exported from Bokhara to Cabul, and I believe to Umritsur in the Punjab. The great bulk of it is said to be sent at present to Russia, and manufactured into a kind of broad cloth, called "Salatiska," which is worn by soldiers.

It being my intention to publish some notes on the Natural History and Geology of this part of Korassan, I shall again have occasion to notice this animal more at length, and I will therefore pass on to what I dare say will be deemed the most interesting part of his history, namely, the wool he produces.

No. 1.—Is a sample of the wool taken from the sides and back of a full grown male Bactrian Camel, in the winter clothing. It is so thickly disposed, that the skin of the animal can with difficulty be discerned beneath it, even when the wool is turned back for that purpose.

In the spring, as the temperature grows milder, the whole of this wool detaches itself from the skin, being pushed off in masses and flakes by the hair which springs up beneath it, and which forms the summer clothing of the animal.

It is at this season pulled or cut off, and after being cleaned, is either manufactured into woollens of different texture for home consumption, or exported in a raw state to Russia; a small quantity also finds its way to Cabul and the Punjab.

It is produced abundantly both in Bokhara and Balk, and the Steppes of Tartary.

This wool is called "*koork*," or down.

It appears to be little inferior in fineness to that procured from some breeds of Shawl Goats, while it possesses a decided advantage over them all, in being both of a much longer fibre, and far more easily freed from the hair.

No.2.—Is a specimen of coarse thread spun from this wool by the hand, *i. e.* without the aid of the wheel; the wool is gathered into a mass, a small portion twisted into a thread by the fingers, and then attached to a cross stick with a weight, or to a stone which is kept twirling round, while small portions of the wool are continually added.

The threads thus made are coarse, and liable to break from being too loosely twisted.

This method is, however, very generally practised, more especially in these districts; the same also prevails in most parts of the Himalaya, and is in use even in the provinces of India in the spinning of cotton threads for common purposes.

Woollens made from threads thus twisted, are far more difficult to weave than those manufactured from threads spun by the hand wheel, as the looseness of the twist often causes them to catch and break as the shuttle passes to and fro.

No. 3.—Is a sample of the wool and hair, taken from the fore-arm.

No. 4.—Is taken from the under part of the neck and throat.

The hairs in these samples are so long, that the trouble of cleaning the wool would, I should imagine, be much lessened, and probably the hair itself might prove an useful article for making pencils and other brushes.

These wools are all taken from an animal which wintered at Candahar, so that the probability is, that the staple was not so long as it would have been, had the camel remained in the more Northern districts.

There is also another thing to be observed, which is, that the beast was not worked during the winter season, and consequently the wool was uninjured by the friction of a load.

It is both shorter and coarser when the animal has been laden. No doubt too, there may be as much difference between the wool of different camels, as between sheep; but the samples sent may be deemed upon the whole a fair selection, considering the limited range of my observation on the subject.

No. 5.—Is a sample of wool taken from the humps of a male Bactrian Camel, that had been much worked during winter.

No. 6.—Is from the sides of the same animal.

No. 7.—From the neck and fore-arm.

These are natural ringlets or bunches. The colour of these wools is generally that of the specimens herewith sent, but the long hair of the neck and fore-arm sometimes has a reddish or ferruginous tinge.

That which I have termed "hair," appears to be not very much, if at all, inferior to some of the coarser wools of Europe, while it possesses a decided advantage in being more than double the length of any sheep wool.

With regard to the utility of this wool, and the chances of its proving desirable in the home markets, I do not consider myself competent to judge. I send the samples to speak for themselves, to ascertain the probability of its ever becoming an article of import either in the crude or manufactured state.

Dromedary.

In addition to the above, I enclose a sample of a woollen cloth made from the soft wool procurable from the young Dromedary.

This is called "*Buruk Shootur-i.*" It is made by the Huzarreh of the Cabul neighbourhood.

It is manufactured in pieces of from fifteen to eighteen inches wide, by six to eight yards long, and the price varies with the size from eight to thirty rupees per piece.

There are two other woollens which I have not yet been able to procure, but I will send them shortly in a supplement to this. They are called "*kart*" and "*oormuk.*"

N. B.—Since writing the above, I have procured specimens of *oormuk*, which I now enclose. It forms part of the dress of the Turcoman people. It comes also from Bokhara. This is chiefly purchased by the wealthy, and sells from fifty to one hundred rupees per piece.

"*Kart*" is somewhat similar to this. It comes from Bokhara and Turkistan, and is made from the wool of the yearling Dromedary.

Public Papers relating to the Nurma or Chanderi Cotton, in reference to queries by MR. PIDDINGTON, Journal Asiatic Society Vol. x. p. 716 being a report by CAPT. J. ABBOTT, Assistant Resident Nimaur.

(No. 4013 of 1842.)

From R. N. C. HAMILTON, ESQ., Secretary to the Government, N. W. P. to F. J. HALLIDAY, ESQ. Officiating Secretary to the Government of India, Fort William, dated, Camp Ferozepore, the 31st December, 1842.

Revenue Department.

SIR,—I am directed by the Honorable the Lieut. Governor, to transmit to you, for the purpose of being laid before the President in Council, the annexed copy of a letter, No. 1241, from the Resident at Indore, dated the 24th November last, with its enclosure, relating to the cotton of Nimar and Chanderi.

2. A counterpart of this letter is forwarded to the Secretary to the Government of India with the Governor General.

I have the honor to be, &c.

(Signed) R. N. C. HAMILTON,
Secretary to the Government, N. W. P.
Camp Ferozepore, the 31st December, 1842.

(Copy.)

No. 1 in No. 4013 of 1842.

No. 1241 of 1842.

From the Resident at Indore, to R. N. C. HAMILTON, ESQ., Secretary to Government, N. W. P., dated Indore Residency, Camp Islamnugger, the 24th November, 1842.

Political Department.

SIR,—Sometime ago I received through the Resident at Gwalior a reference from you on the subject of the Nurma cotton, together with a copy of Dr. Purvis' report on that of Chanderi, which was supposed to be the same. In replying to Lieut. Col. Speirs, I forwarded a copy of my letter to Mr. Bushby, in reply to a requisition from his office on

the same subject, which I requested the Lieut. Col. to transmit to you ; I mentioned at the same time, that I could refer to Captain Abbott, Assistant in Nimar, for additional information, as the cotton used in the Chanderi fabrics was stated to come from Nimar, and the question was more interesting to that part of the country, as it affected a staple article of its commerce, than to Malwa generally, in which cotton does not appear to succeed, and is but partially grown.

2d. I have now the honor to submit copy of a valuable report, which I received from Captain Abbott, and of its accompanying letter, from which it will be seen, that the cotton formerly exported to Chanderi is called Mahalie, and not Nurma, which indeed, as before pointed out by me, is not an annual, but a large plant, which lasts about ten years.

3d. During the last rainy season, I planted a patch of ground in my garden with the Nurma cotton, from which when ripe, I intend sending the specimen together with those of the soil in which it grows, promised in my letter of the 1st November 1841, to Mr. Bushby.

4th. I may add, that I have lately procured from the Agricultural Society in Calcutta, a supply of the Georgian cotton seed, which I am distributing among the different states in Malwa and Nimar.

5th. In closing my letter on the subject of these cottons, I need scarcely remind Government, after Sir John Malcolm's copious report on Central India, of the richness of Malwa, and its adjoining provinces in productions important to commerce. The interest which that distinguished officer attached to them, induced him, from his first arrival in the country, to bestow an attention to their investigation worthy of the Government which he represented, and the results of which were found to be such, as to obtain for him the acknowledgments of learned Societies. Since his time, the subject would appear to have been entirely neglected, which cannot but be regarded as a misfortune to a country in which we hold so prominent a position, as to impose in my humble opinion an obligation on us to develop its resources, and from which we derive a revenue averaging at least twenty lacs of rupees per annum, collected on the spot at an insignificant expense. A renewal of these researches would, however, be of little practical benefit to the country, unless the means of communication with other parts were simultaneously improved. Government has done something to promote the object by entertaining the project of improving the road between

Agra and Bombay; but our duty cannot cease even with the thorough completion of that work, and I trust that as the finances of the state improve, a sense of its importance will arrest the favorable consideration of an enlightened Government.

6th. The Government of Bombay, from its proximity to these provinces being interested in these discussions, I have deemed it my duty to forward a transcript of the present Despatch and the correspondence to which it relates, for the information of the Honorable the Governor General in Council of that Presidency. I have, &c.

(Signed,) C. M. WADE,
Resident.

(True copy,)

(Signed.) R. N. C. HAMILTON,
Secretary to the Government, N. W. P.

Indore Residency, Camp Islamnugger, the 24th November, 1842.

(Copy.)

No. 2 in No. 4013 of 1842.

No. 331 of 1842.

From Captain J. ABBOTT, Assistant in Nimar, to Lieut. Colonel. Sir C. M. WADE, K. C. B., Resident at Indore, dated Mundlairsur, 30th September, 1842.

SIR,—In reply to your letter and its enclosure of the 13th April last, relating to the Nurma (Mahalie) cotton, I have the honor to forward for the information of the Asiatic Society, all the particulars I have been able to collect regarding it. There seems great probability, that it may be utterly lost from the world in the course of a few years, unless Government or some Society interfere to rescue it.

2. The mamoodies of Chundairee, so far as I can learn, were considered unequalled by any other manufactures, in itself a strong argument for the surpassing fineness of the Mhablie cotton of which they were woven. I believe there is little of the cotton soil of Nimar that would not produce it in more or less abundance, could a market be found for it.

3. Accompanying my report are seven small tin boxes, of which three contain specimens of Mhahlie cotton, two specimens of the Nurma and its seed, and the remaining two specimens of the common cottons of Nimar and Berar. Circumstances prevent my sending just now specimens of the soil in which the Mhahlie thrives. I purpose selecting them at a season more favorable to the design, the ground being now strongly impregnated with manure.

I have the honor to be, &c.

(Signed) J. ABBOTT, *Captain,*

Mundlaisur, the 30th September, 1842.

Assistant in Nimar.

P. S. I have the honor to return the copies of correspondence upon this subject, with which you favored me.

(True copy,)

(Signed) R. N. C. HAMILTON,

Secretary to the Government, N. W. P.

No. 3 in No. 4013 of 1842.

(Copy.)

Particulars relative to the Mhahlie Cotton of Nimar.

Q. 1st. What is the Nurmah cotton of Malwa? Is it the common cotton of the country, or a choice sort?

A. Nurma cotton is not indigenous to India. It is not, so far I as can learn, cultivated for manufactures in Nimar or Malwa. It is not annual, but grows into a bush, lasting ten or twelve years. As this cotton is evidently not the kind to which the queries of the Asiatic Society refer, I shall consider the name Mhahlie substituted for Nurma, and answer accordingly.

The Mhahlie I should say, cannot be indigenous to Nimar. The natives suppose the seed to have been sent, time out of mind, from Chundairee. They are utterly ignorant of its manifest superiority in texture to the cotton of the country, and it has never been in demand in Nimar, where in a few years its existence will altogether cease.

Q. 2d. Does it grow in any common cotton soil? or are peculiar sorts and spots sought out for it?

A. It will grow in any cotton soil, but formerly its high price commanded for it the choice soils.

Q. 3d. What manure, if any, is used to it?

A. The soil is prepared for Mhahlie cotton, precisely as for other cotton. The manure is dung and black earth from the villages.

Q. 4th. When sown? How sown? When harvested? How cleaned?

A. It is sown like other cotton at the end of June, but harvested about forty days later than the common kind, *i. e.* about the end of March. It has never been cleaned in Nimar, but was exported to Chundairee in the pod. The meaning of which I presume was to enable the workmen there to sort it, previous to cleaning, for the several qualities of manufacture in contemplation.

Q. 5th. What price does the best sort command? Whither is it exported, if at all?

A. The Mhahlie cotton so long as it had any peculiar value in Nimar or rather at Chundairee, where alone there has ever been a demand for it, sold in Nimar at fifty per cent. higher than the common cotton, and at Chundairee it sold at one and a half seer for the rupee, when the ordinary kind was selling at five seers; at present it sells for the same price as the common cotton, which, however, being white and having a coarser, perhaps stronger, filament, is preferred in the Nimar market; so that it appears to be cultivated at present merely from the accident of its seed being in possession of the ryuts, who formerly cultivated it with profit.

Q. 6th. Is it an annual cotton, or does it last more than one year?

A. It is annual. The Nurmah is not.

Q. 10th. Enquiry should be made, if it at the time of ripening any peculiar manure is added, as with some of the choice sorts of tobacco. If the plants are topped, the shoots pinched, or beaten with sticks, or allowed to be eaten down by animals. All these processes are used in various parts of the world (America, the French and Spanish Colonies, Persia, &c.) and no doubt influence both the productiveness and the quality of the cotton to a great extent. Nothing relative to the native methods of culture, irrigation, &c. should be overlooked.

A. No peculiar manure is added at the time of ripening. The plants are never topped; a process I have never known applied to cotton crops in India. It is sown in both rubbee and khureef soils; in the latter, it is alternate with jowaree. The difference in produce afforded by these two soils, *viz.* the irrigated and unirrigated, is very great.

Q. 12th. Enquire if it is subject to any diseases, or insects, which seriously affect the returns from it.

A. I can learn of no disease or insect to which the Mhahlie cotton is peculiarly liable. It is less affected by frost.

Q. 13th. The amount of return in clean merchantable cotton per beegah of a known number of square yards is of importance, and the average price of the best sort.

A. The produce of the Mhahlie is greater than that of the Goondailah, or common cotton of Nimar.

The ordinary crop of the latter is four maunds (of eighty rupees) per beegah of 22,500 square feet uncleaned, whereas the same area will return from five to six maunds of Mhahlie.

Moreover, the seed of the Mhahlie being smaller and the pod larger, (of the latter fact I am not so certain,) five chittacks of clean cotton are yielded by a seer of pod, whereas only four chittacks are obtainable from the common cotton. When the Mhahlie is irrigated, it will yield from seven to eight maunds of pod per beegah. Hence the produce per beegah of 22,500 square yards in merchantable cotton, is sixty eight seers and twelve chittacks for unwatered, and ninety-three seers and twelve chittacks for irrigated land; the seer being of eighty rupees, Company's. This advantage is reduced by the difficulty of disposing of the Mhahlie cotton.

The growth of the Mhahlie was confined to two pergunnahs of Nimar, Dhurgaon and Kussode, and to a few villages of those pergunnahs I should add to a single village of Muhaiswah. Those pergunnahs seem to have been selected from their proximity to Chundairee, for the market of which alone it was ever reared. Although at Muhaiswah and Kurgaon of Nimar, there are several celebrated manufactories of mamoodies, dhooties, khun, phatub, sahries and chadurs, some having silken and others golden borders, the Mhahlie has never been employed at either of those places. The extensive importation of fine cotton cloths from England seems to have annihilated the Chundairee manufacture, so that there is no longer any demand for the Mhahlie, which is selling at present cleaned at five seers the rupee in Nimar, the price of the common kind. The facts above detailed may illustrate the difficulty of introducing amongst the ryuts of India, any improvements that may seem to us for their advantage. Having no

capital, they cannot select their markets, and any novelty in the texture or hue of a commodity gives it disadvantage in the market of the district. Although the softness of the Mhahlie cotton is too remarkable not to be perceived at once, yet it has remained in this district an unknown number of years, utterly disregarded.* There can be little doubt that if sent to Bombay, it would command the market for export there, and the experiment seems quite worthy of trial; there is no difficulty in separating the seed. But the colour is not white, and the method employed in bleaching the Mhahlie at Chundairee, should be ascertained from gentlemen resident at Sâgor. It were also a curious enquiry to be made at Chundairee, when the manufacture of mamoodies was first established there. What led to the selection of the Mhahlie cotton, and (if it be of foreign origin) what induced the choice of Nimar as the garden of its produce, other, and I believe richer, cotton lands being near to Chundairee. In addition to its defective hue, the manufacturers of Nimar conceive that the filament of the Mhahlie is not so strong as that of the common cotton, and in consequence prefer this for the coarse cloths woven in the villages. Indeed the manufactures at Muhaiswah and Kurgaon, although rich and extensive, are not celebrated for the fineness of their texture, as were those of Chundairee; and therefore so long as the Mhahlie maintained its high price, there is little wonder that the enterprising Hindoo manufacturer neglected it.

Of the Nurmah I cannot learn many particulars in this district, where, as an article of produce it is quite unknown. The natives allow that it is very superior to the common cotton; but they object to the expense and trouble of preserving it from injury throughout the year. Nothing can more strongly exemplify the apathetic spirit of the ryot; for the jungles in Nimar bring up to every cultivator's door an abundance of thorny plants fitted for enclosures, and I imagine the produce of the Nurmah must be about four times that of the common cotton plant, for it rises to the height of seven or eight feet, branching out on all sides. It is said to abound in Kurrah Manickpore. Its hue is whiter than that of the Mhahlie, and the natives of

* We trust that this really beautiful varieties of Cotton will now be better studied and known, and this scientifically for they are not only in all probability valuable in themselves but they may become invaluable to India as stocks from which to *breed* new sorts, a process apparently not yet dreamt of amongst our Cotton experimentalists.—ED.

Nimar think its filament finer: but this I doubt. The specimens I have the honor to send are scarcely worthy to be called such, and should not be relied on, being the produce of isolated trees, the comparative value of which I have no means of ascertaining. The Mhahlie and Goondailah specimens are worthy of reliance. There can be no doubt that the soil and climate of Nimar are capable of producing varieties of cotton vastly superior to the staple of the district, and I believe the same fact has been proved in regard to other tracts of Hindoostan. But it seems equally certain, that in order to the introduction of such improvements, a market must in the first place be created for the produce. This it might be well worth the while of Government to effect. Wherever water carriage admits of ready transfer to extensive marts, the demand would speedily render this interference needless.

Choolie Muhaiswah is a misnomer, only one village in that district having produced the Mhahlie cotton. Dhergaon is the chief garden and mart of the Mhahlie, but being an obscure pergunnah, the principal neighbouring town has naturally been used to designate the locality.

I received the despatch relating to this cotton at the most busy season of the year, when it was impossible for me to quit the station even for a few hours. The rains have since commenced, and the earth being recently manured I think it advisable to await a better season for selecting specimens of the soil. I have detained this report several months, in the hope of sending specimens of the Berar cotton, for which I had written to Nagpore. But owing to a very simple mistake of the merchant at that place, I am disappointed for the present, as the Mhahlie cotton is said to be sometimes designated Berari, and the soil and climate of Berar and Nimar cannot, I imagine, be very dissimilar, I thought it of consequence to compare together the growth of these two districts, in order to trace the origin of the Mhahlie.

The climate of Nimar is very equable. The temperature nearly that of Calcutta. It is in the same latitude, and elevated only about 500 feet above the sea. The air, however, is much drier, as might be supposed from its inland position, and the springs are seldom nearer than thirty to forty feet to the earth's surface. The formation is trap, occasionally basaltic. I have never heard of this thick crust being completely perforated, whether by human act, convulsions of nature,

or the action of the elements: although the Vindhya mountains abound in chasms from 300 to 800 feet in depth, and present on the south a precipitous scarp of 1,500 feet; and the Nerbudda has farther sapped into the rock some 800 feet, reckoning from the foot of those mountains. The immediate deposit upon this rock in Nimar is generally a deep bed of clay, mixed with lime, sand, and kankur. Occasionally rotten sandstone prevails: and upon this stratum lies the black soil generally found upon trap formations, though not peculiar to such. This averages perhaps fifteen feet in depth near the river, but is deepest when found on higher flats, having been less worn by the elements. This black soil is generally supposed to be the debris of the trap formation, and from thence to take its hue; I confess I doubt the correctness of this theory. Trap is colored wholly by the black, or purer oxide of iron. It is decomposed by the absorption of an additional volume of oxygen by the iron, which increasing its mass, rends the rock into powder. In this condition, the color of the trap is a rusty red, and incapable I think of giving that intensely black dye to a soil composed of its particles. I speak under correction, having no means of analyzing the soil. But as a similar hue occurs in soils resting upon granite and other formations, I have been more disposed to ascribe it to the presence of carbon, than of iron. It is singular that under this soil, the richest diamond mines in the world are found. The fact, that a stratum of clay and kankur is interposed between the trap rock and the black soils, seems to countenance my theory, and the yearly destruction of the jungles in Malwa by fire, would in the course of ages have supplied an abundance of carbon. But if, as is said, this black soil form under the blowpipe, a black glass, the theory can scarcely be maintained with any confidence.*

The natives prefer the blackest soil for all kinds of cotton, and in fact, for every purpose. The other soils are all more or less impo-

* The black cotton soil certainly owes its colour also to the protoxide of iron, and not to carbonaceous matter. See Transactions of the Agricultural Society Vol. vi. p. 208, in which are quoted three analyses of this soil from Bundelcund. It is possible that the black soil may be owing to the decomposition of a kind of trap no longer existing, which contained a greater proportion of alkali, (soda, or potash) than the present and more enduring kinds of the rock, or it may have been an original volcanic product? or a volcanic mud of a peculiar kind? The question is one far too obscure and complicated to be discussed in a note, and indeed to be discussed at all in the present state of our knowledge.—H. P.

verished by a mixture of lime and sand, the black soil requires moderate but frequent irrigation. It is full of the germs of vegetables, becomes a mucilage when wet, and a rock when dry.

The monsoon in Nimar is usually mild, the table land of Malwa carrying off the greater body of vapour. The ryots dread very heavy falls, or the long prevalence of cloudy weather.

I regret that my recent acquaintance with this district, so greatly limits my means of collecting immediate information, and renders the report so meagre and imperfect.

(Signed) J. ABBOTT, *Captain,*
Assistant in charge of Nimar.

Mundlaisur, Nimar, the 30th September, 1842.

P. S.—Since writing the above, I have ascertained that at Chundairee they do not clean cotton by the ordinary method of passing it between parallel rollers, but by the more gentle process of rolling over it with the hand an iron ruler, or thin cylinder, a polished stone being beneath. This saves the fibre from fraying, and is practised by the Bullaees, (outcasts,) whose females make the finest of the thread employed in Indian fabrics. During this process, they extract all the particles of leaf, pod, earth, &c., as well as coarse fibres of the cotton itself. In the exquisite fabrics woven at Chundairee, the length and perfectness of the fibre must have been of the utmost consequence, and it appears to me, that length of fibre was the principal recommendation of the Mhahlie cotton. A specimen of Berar cotton having just arrived, is forwarded.

(Signed) J. ABBOTT.

(True copy.)

(Signed) W. S. EDEN,
1st Assistant to Resident.

(True copy.)

(Signed) R. N. C. HAMILTON,
Secretary to the Government, N. W. P.

(True copy.)

F. J. HALLIDAY,
Officiating Secretary to the Government of India.

*Proceedings of the Asiatic Society.**(Friday Evening, 11th November, 1842.)*

The Honorable the President in the Chair.

The following Books were presented by the Authors, and purchased by the Society.

Books received for the Meeting on the 11th November, 1842.

The Calcutta Christian Observer, November 1842. Presented.

The Annals and Magazine of Natural History, June and July, 1842. Vol. IX, Nos. 58 and 59. Purchased.

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 3d Series. Vol. XX, Nos. 132, 133, and 134. Vol. XXI, No. 135. London, 1842. Purchased.

Edinburgh New Philosophical Journal, by Professor Jameson. London, 1842. No. 64. Presented by the Author.

Journal des Savans. Paris, Janvier, Fevrier, Mars, Avril, Mai, 1842. Purchased.

Tracts, Historical and Statistical, on India, by B. Heyne. London, 1814, 4to. one Vol. Purchased.

Bulletin de la Société de Géographie, 2nd Serie, Tome XVI. Presented.

Histoire Naturelle des Poissons, Tome XVI. Purchased.

Jahrbücher der Literature. Wien, 1841, Nos. 93, 94, 95, 96. Purchased.

Geschichte der Ilchane, das ist der Mongolen in Persien. Von Hammer Purgstall. Darmstadt, 1842, Erst Band. Presented by the Author.

Bopp, über die Verwandtschaft der Malayisch-Polynesischen Sprachen mit den Indisch-Europaischen. Berlin, 1841, 4to. Presented by the Author.

Newbold on Ipoh, or Upas Poison used by the Jacoons and other Aboriginal Tribes of the Malay Peninsula. London, 1837, Pamph. Presented by the Author.

L'Espagne Artistique et Monumental, Planches lithographies by D. Genaro Perez de Villa-Amil. The text by D. Patricio de la Escosura and the Plates lithographed by Victor Adam Arnout Bachelier, &c. &c. No. 1, containing four Plates.

Much attention was excited by the splendid work on Spanish Architecture last mentioned. It is sent to this country in the hope of finding some part of that support which it so richly merits, as an almost unequalled production of the lithographer's and designer's arts.

Read a letter from Count Graberg, soliciting the honour of being elected a Corresponding Member of the Society. The application was referred to the Committee of Papers for report.

Read the following letters from the Government of India :—

No. 178.

To the Secretary to the Asiatic Society.

Military Department.

SIR,—I have the honor, by direction of the Hon'ble the President in Council, to transmit to you for communication to the President and Members of the Asiatic Society, and for publication in their Researches, as a sequel to the articles in which

previous results of the same work have appeared, the accompanying Despatch, in original, No. 36, dated the 13th August last, from the Surveyor General of India, containing the final report upon the operations for measuring an Arc of the Meridian, carried through the centre of the Peninsula to the Northern confines of Hindoostan.

2. The Society will no doubt publish the report in communication with, and under the correction of, Lieutenant Colonel Everest, or such of his Assistants as he may think proper to entrust with its supervision through the Press, so as to ensure that it will be printed with the requisite accuracy; and as they may probably be desirous of annexing to the report the lists of latitudes and longitudes ascertained by the Triangulations, which have been communicated to Government, a copy will at an early opportunity be furnished for the purpose.

3. I am to request, that the original Despatch of Colonel Everest may be returned when no longer required, and that the Society will be so good as to favour this department with a few spare copies on Europe paper of the report when printed, for record, and for the purpose of transmission to the Hon'ble the Court of Directors.

I am, Sir,

Your most obedient servant,

Council Chamber, 14th Oct. 1842.

W. M. N. STURT, Major,
Offy. Secy. to the Govt. of India, Mil. Dept.

It was resolved—That arrangements should be made for complying, at the earliest possible moment, with the wishes of Government. A note from Major BEDFORD was received, stating that the Tables of Latitudes and Longitudes would be forwarded as soon as ready.

No. 296.

H. TORRENS, Esq.

Secretary, Asiatic Society.

SIR,—In compliance with instructions received from the Council of Education, I have the honor to inform you, that a Deer now in possession of the College Council, has been ordered to be transferred to the Asiatic Society, and I have been directed to place myself in communication with the authorities of that body, with a view to effecting the transfer of the said specimen, and of receiving in return any Morbid Specimens, and duplicates of Anatomical objects, whether human or comparative, which can be spared from the Museum of the Society, and are likely to be of use in that of the Medical College.

2. In order that the above may be effected in the most satisfactory manner to ensure the safe transit of the object in question, I have the honor to request, that you give the necessary instructions, to the gentleman in charge of your Museum, to whom it will be made over at any time, or in any manner which he may wish.

I have likewise to request, that you will direct the same officer to furnish me with a list of objects, which the Asiatic Society may think equivalent to the Deer in question.

I have the honor to be, Sir,

Your most obedient servant,

Medical College, Nov. 9, 1842.

FRED. J. MOUAT, M. D.

Secretary, Medical College.

Resolved—That Mr. BLYTH be requested to effect this change, and by making over to the Medical College the Society's collection of specimens of Morbid Anatomy.

No. 999.

To H. TORRENS, Esq.

Secretary to the Asiatic Society.

General Department.

SIR,—With reference to the correspondence noted in the margin,* I am directed to state, that the Hon'ble the Court of Directors have reported the receipt of the following contributions presented by the Asiatic Society for the Museum of the East India House; viz.

One case of Duplicate Specimens of Birds.

One case containing two Jars of Reptiles.

One case of Geological Specimens, collected by Lieut. Hutton, at Spiti in the Himalayas.

I am, Sir,

Your obedient servant,

Fort William, the 28th Sept. 1842.

H. V. BAYLEY,

Depy. Secy. to the Govt. of Bengal.

It will be recollected, that this dispatch was made in February 1841, from the Museum. See Journal, Vol. IX, page 1056.

No. 982.

To H. TORRENS, Esq.

Secretary to the Asiatic Society.

General Department.

SIR,—I am directed to transmit the accompanying copy of a letter from the Military Board, No. 3,373, dated the 1st instant, and of its enclosures, being a letter from Capt. Tremenheere, with that Officer's second report on the Tin of Mergui.

As the specimens of tin forwarded to you with my communication No. 1,773, dated the 20th December last, can be probably duplicated, I am directed to request, that a set may be furnished to this department for transmission to England, as recommended by the Military Board.

The three boxes of specimens referred to in the Military Board's letter, will be transmitted to the Society when received, for the purpose of being in like manner duplicated, one set for the Hon'ble Court, and the other for the Museum of the Society.

I am, Sir,

Your obedient servant,

Fort William, the 12th October, 1842.

H. V. BAYLEY,

Depy. Secy. to the Govt. of Bengal.

The Curator of the Museum Economic Geology was requested to give due effect to the wishes of the Military Board, and the Secretary to publish Capt. TREMENDHEERE'S Report in the Journal.

A letter from Lieut. BAIRD SMITH, B. E., N. W. Provinces, was read, stating that he was engaged in researches about Indian Earthquakes, and requesting particularly the assistance of the Society in procuring a copy of a Persian or Hindoostanee work relative to this subject, entitled the ZIL-ZILLEE NAMAH. The note was referred to the Librarian to enquire for the work in question.*

THE EARTHQUAKE.

Shortly after the above letter had been read, a smart earthquake was felt! The following note relative to it was drawn up, and signed by the Hon'ble the President, as expressing generally the opinions or feelings of the meeting:—

Memorandum.

At $\frac{1}{4}$ to 10 P. M. the proceedings of the Society were interrupted by two or three slight vertical shakes or heaves, with a noise like the rumbling of a passing carriage, and one strong horizontal shake from East to West, or from N. E. to S. W. The whole took place within about half a minute of time. H. T. PRINSEP.

We may add, that the Barometer stood about half an hour afterwards at 30.5, and the Thermometer at 80°. The weather was squally with light showers at times from the East, but clear and cool in the intervals. The exact time at which the shock took place was, as will appear from the following note from Mr. E. GRAY, Watchmaker, 9h. 38m. P. M.

To ascertain the exact time as nearly as possible, Mr. Piddington addressed a Note to Mr. Gray. His reply is as follows:—

DEAR SIR,—I did note the time when the Earthquake took place. It ceased at 9h. 38m. P. M. My clocks, as you may suppose, required my immediate attention, and I found their weights swinging in a direction somewhat from the North of the East point to the South of West, but from which of these quarters it came, I cannot pretend to say.

Yours most obediently,

15th November, 1842.

E. GRAY.

A paper, being a first article of "Contributions towards a History of the Development of the Mineral Resources of India," by S. G. TOLLEMACHE HEATLY, Esq. was presented, and referred to the Editor of the Journal for publication.

* No trace of this work could be found, and the Calcutta Persian literati doubt of its existence. Two extracts, one from the Ewatee-oos-Seir and the other from the Herat-ul-Hecmut, were sent to Lieut. Baird Smith by the Secretary.

Two papers of "Notes, principally Geological, from Bellary to Bijapore in Southern India," by Capt. NEWBOLD, of the Madras Army, were also presented, and referred to the Editor of the Journal for publication.

A letter from Capt. BOGLE, Commissioner at Arracan, accompanying a copy of a "Report from Lieut. TRAIL, of the Quarter-master General's Department, under date 12th April 1826, on the Route from Pakung Yeh in Ava to Aeng in Arracan, as pursued by a Detachment of British Troops under the Command of Capt. ROSS, M. A." was read. The Report was referred to the Editor of the Journal for publication.

For all the foregoing Communications, the thanks of the Society were ordered to be returned.

Read the following report from the Curator:—

SIR,—The interval since our last Meeting has not been signalized by much in the way of discovery of new species of animals, nor have many species been added to the Museum which it did not previously contain; but much has been done towards completing the required series of specimens of various species already possessed, and acquisitions of the first and second kinds above noticed have not been wanting.

In the class of Mammalia especially, here so difficult to obtain recent specimens of, have been added a Neelghai, an Axis Deer, a fine specimen of the adult male *Felis Chaus*, one of *Viverricula Indica*, a young Monkey (*Macacus Rhesus*), of which, though common in Bengal, we did not previously possess an example, a young Mongoose (*Herpestes griseus*), and a considerable number of Bats, shot by myself, and comprising at least some, if not several, undescribed species.

From the Barrackpore menagerie, has been received a recent male Neelghai (*Por-tax pictus*), and a male Silver Pheasant (*Phasianus Nycthemerus*).

From P. Homphray, Esq., an emasculated Axis Deer (*Cervus Axis*), accompanied by a note from which I extract the following particulars, and refer the reader to my remarks on the growth of antlers in castrated Deer, published in p. 598, *ante*.

"Mr. H. had this Deer castrated in June, 1839, on account of his being extremely vicious: two or three weeks after the operation, he dropped his horns, and new ones grew in their place, since which he has not shed his horns. Mr. H. need scarcely mention that Deer when castrated do not afterwards [*apud* Buffon] renew their horns, except as Mr. H. supposes in the present case [the preparatory processes for] the formation of the new horns had commenced before castration; after which operation, the skin of the horns does not peel off as it does in all other cases when the horns arrive at maturity, but continues to grow on thick and fleshy. Mr. H. has another castrated Deer of the same species alive, whose horns are in the same state as those now sent, and he also shed his horns once after castration."

The specimen of *C. Axis* presented by that gentleman to the Society has the horns of normal shape, and of tolerable size, but imperfectly developed towards their extremities, particularly rugous, and the thickened skin which invests them is almost totally denuded of hair.

From J. Stalkart, Esq.

A fine recent specimen of the male *Felis Chaus* :

Ditto of *Viverricula Indica* : and

A beautiful Lory (*Lorius grandis*, vel *puniceus* of Gmelin).

From R. W. G. Frith, Esq.

A frontlet of *Cervus Duvaucellii* :

Ditto, with abnormal antlers, of *C. Hippelaphus* : and

A living female of *Gallinula lugubris*.

From Dr. Mouatt,

A Bat : and

A small collection of Insects from Darjeeling.

From J. Heatly, Esq.

Three hottles of Snakes, believed to be from the collection of Dr. Russell, and probably the individuals figured in his celebrated work on Indian Serpents. Two of the species, however, are very common in this neighbourhood; viz. the *Coluber dhamna* and *Tropidonotus dora*, and the third is *Bungurus annularis*, Daudin, or the *Bungarum Pamah* of Russell, pl. III.

Of the species collected by myself, the most interesting are two *Falconidæ*, which I have been fortunate enough to shoot in the neighbourhood: viz.

The European Hobby Falcon (*Falco Subbuteo*): and

A splendid adult male of *Spizæetus niveus* (v. *Nisæetus Nipalensis*, Hodgson), having the white under-parts beautifully lined with black.*

With much respect,

Sir,

I remain, yours obediently,

E. BLYTH.

Report of the Curator of the Museum of Economic Geology, for September and October, 1842.

I regret to say that illness has prevented my doing much in September and part of October, but in recompense we have many additions to record.

Museum Economic Geology.—We have received from Lieut. YULE, Executive Engineer, Cherra Poonjee, a capital set of drawings of the process of procuring and manufacturing the Iron Ores of that locality, with a very complete suite of specimens to accompany them, and an able paper, giving full accounts of the work, cost, &c.

From Capt. TREMENHEERE, B. E., we have to acknowledge two boxes of Tin Ore from Tenasserim, with one of the decomposing granites which form its matrix. Also, a very complete assortment of specimens of timber, with a bottle of the *Theetsee* Varnish and a sample of Gum Kino. The note relative to all these has not been yet received, so that I am unable to label and place them on the table. They will appear at the next meeting. Captain Tremenheere also suggests that our acknowledgments for contributions should be in some form like that of the accompanying engraved letter of the Royal Geological Society.

* I have since obtained other examples of this species, the most remarkable of which is a fine old female entirely of a *dusky-black* colour, with a dash of grey on its upper-parts. This was paired with a male of an ordinary colour.

Lieut. RIGBY, B. E., has sent us from Cuttack, a valuable assortment of the Building Materials, (stone, timber and iron,) used in that province, with a very complete memorandum accompanying them.

Mr. INCE, Salt Agent at Burrisal, has forwarded us another block of wood perforated by the destructive Worm of the rivers of that quarter, with two bottles of the River Water. This last I am collecting for every month in the year at the two extremities of the Deltas, those of the Megna and Ganges, so as to obtain some approximate notion of the quantity of silt carried to the ocean by our rivers; a problem of the highest interest to geology.

Mineralogical and Geological.—Captain NEWBOLD, of the Madras Army, a zealous friend to these researches, has presented us with a collection of 150 specimens, Mineralogical and Geological, from Egypt, Aden, and Southern India, and has added greatly to their value, by a detailed descriptive catalogue, of great interest.

I have, as before stated, been wholly occupied with our minerals, which are now so far on the road to arrangement, that they are in groups and families, so as to allow me to place from all our old collections such specimens as are of value, or serve to fill up blanks: a work of much time and labour, from the scattered and confused state of the old collection, which is such, that the most valuable specimens are often the most difficult to find.

H. PIDDINGTON,

Cur. Mus. Econ. Geol.

Museum, 1st Nov. 1842.

With reference to the ornamental letter recommended by Capt. TREMENHEERE, it was determined that the Society's engraved Plate might be used for the letters of the Museum with a lithographed addition.

Proceedings of the Asiatic Society.

(Friday Evening, 9th December, 1842.)

The Honorable the President in the Chair.

The following list of Books, presented and purchased was read, and the thanks of the Society voted to the donors.

Books presented to the Library of the Asiatic Society, at the Meeting on the 9th December, 1842.

The Calcutta Christian Observer, new series, December, 1842, vol. III, No. 26,
1 pamph.

The Oriental Christian Spectator, 2nd series. Bombay, September and October,
1842, vol. III, Nos. 9 and 10, 2 pamph.

The Calcutta Literary Gleaner, December 1842, vol. I, No. X, 1 pamph.

Journal des Savans, Juin, 1842. Paris, 1 pamph.

Edinburgh New Philosophical Journal, by Professor Jameson, 1842, No. 65, 1 vol.

Journal of the Royal Geographical Society of London, 1841, vol. XI, parts 1 and 2,
2 vols.

Journal Asiatique, 3rd series. Paris, Aout á Decembre, 1841, tome XII, Nos. 66 á 69, et Janvier, Febre. Mars, 1842, tome XIII, Nos. 70, 71, and 72, 7 pamph.

Proceedings of the Geological Society of London, 1841-42, vol. 111, pt. 2nd, Nos. 78 to 83, 1 pamph.

Hamilton's Address to the Royal Geographical Society of London, 1842, 1 pamph.
Voyage au tour du Monde par les Mers de L'Inde et de Chine de M. Laplaœe. Paris, 1839, tome V. 1 vol.

Darwin's Structure and Distribution of Coral Reefs. London, 1842, 1 vol. *Purchased.*

A very curious Coat of chain mail, with rows of plate of thick tortoise-shell, worn by the Dayaks of Borneo, was presented by B. RODYK, Esq. Registrar of Malacca, through Dr. Griffith.

A letter from S. MORNAY, Esq. was read, tendering for sale a collection of Minerals for Co's. Rs. 200. Upon the report of the Curator of the Museum Economic Geology, that a part were of much rarity, or desirable as filling up blanks in the Mineralogical Series, it was referred to the Committee of Papers to arrange, if possible, for the purchase of this part.

Upon the recommendation of Mr. BLYTH, the sum of ten Rs. each, was allowed to the principal and assistant Taxidermists, on account of the very heavy extra work of the month of November, in their department.

Two letters from Mr. BATTEN, C. S. Assistant Commissioner, Kemaon, were read, announcing the dispatch of the interesting Journal of Lieut. Weller, B. E. bringing Capt. Herbert and Manson's Account of the Jowahir Pass into a complete form, and promising, if possible, to send an account of the Dhurma and Bhyanse Passes into Thibet, so that with Mr. Batten's own account of the Neetee Pass, (erroneously printed in the Journal as Mr. Benson's,) a nearly thorough topographical and scientific Description of the Passes of this interesting country will be completed.

MR. BATTEN'S second letter announces the dispatch of some more of Captain Herbert's Journal. The MSS. had been received, and were exhibited. The thanks of the Society were tendered to Mr. Batten and to Lieut. Weller, for their very zealous co-operation.

A highly interesting paper by Captain THOMAS HUTTON, B. N. I. on the habits of a large species of Galeodes, called by him *Galeodes vorax*, from its killing and devouring small lizards, and even killing young musk rats and small birds, though not devouring these (warm-blooded) animals, was presented and read. Referred

to the Secretary to be printed in an early number of the Journal, with the thanks of the Society to Captain Hutton.

A paper on a new genus of Falconidæ, by B. H. HODGSON, Esq. Resident at Kathmandoo, with a note by the Zoological Curator, Mr. Blyth, was also presented, and referred to the Journal for publication.

A summary description of two new species of flying Squirrel, by B. H. HODGSON, Esq. Resident at Kathmandoo, was also referred to the Journal.

Monograph of Indian species of Bats, of the restricted genus *VESPERTILIO*, by E. BLYTH, Esq. Curator, was also presented, and referred to the Journal for publication.

For all these papers and presentations, the thanks of the Society were voted.

Report of the Curator Museum of Economic Geology for the month of November.

Museum Economic Geology—Our contributions for this month are, Capt. Tremenheere's second series from Mergui, comprising the decomposing Granites which form the matrix of the Tin ores of Kahun at that settlement. These were alluded to in my last report, and I have only to add, that Capt. Tremenheere's paper is in the hands of the Printer, the plan which accompanies it in those of the lithographer, and the specimens will be, as suggested by the Military Department, divided for sending to the Court of Directors.

We have also, from the same zealous contributor, a set of fifteen specimens of various kinds of Timber and Woods from Mergui, with a bottle of the Theet-see Varnish, and a specimen of the Gum Kino of that locality, of which, as I learn from Mr. Thomson, of the house of Scott Thomson and Co. considerable quantities are now sending, or have been sent, to Europe.

We have from Capt. BAKER, Superintendent of the Doab Canal, five specimens of Cement, Kunkurs, and Limestones from the Dehli Canal, and other localities in the N. W. Provinces.

The Museum has been referred to by Lieut. Guthrie, from Cachar, relative to some specimens of Stalagmitic Limestone found near that place, and to some water which drips from the rocks where it is formed. The Limestone is a common stalagmitic concretion, and the water contains a little Sulphuretted Hydrogen.

Geological and Mineralogical.—We are proceeding here with our work of arranging the Minerals, but the want of the new cases which are sanctioned by the Committee, impedes us in some degree.

We have no Geological or Mineralogical contributions for this month.

H. PIDDINGTON,

Museum, 1st December, 1842.

Cur. Mus. Econ. Geol.

H. TORRENS ESQ.

Secretary, Asiatic Society.

SIR,—I beg to represent to you the absolute necessity for two more cases in the Mineralogical and Geological department of the Museum.

2. I am already so far advanced with the classification of our rich stores of Minerals, that I have them arranged in genera and families, but even without room for what we have, (for the cases are now too full,) without room for the deficient Minerals to complete our series, and without any chance of room for our valuable fossil shells and other delicate organic remains; we have none for the various contributions which are arriving or promised us from all parts: I have far more, even in geological series, than would fill every vacant corner!

The expence of the two cases will be 106 Rs. complete.

I am, Sir,

Your obedient Servant,

H. PIDDINGTON,

Curator, Museum Economic Geology.

31st October, 1842.

MAJOR W. M. N. STURT,

Offg. Secy. to Govt. of India, Military Dept.

SIR,—I have the honour by direction of the Asiatic Society of Bengal, to acknowledge the receipt of your letter No. 178, dated the 14th ultimo, with its enclosure.

2. In requesting you to convey the thanks of the Society to the H. the P. in C. for this mark of his attention, I am desired at the same time to state for the information of H. H. in C. that the Society will have pleasure in complying with the wishes of Government, by publishing as early as possible the dispatch from the Surveyor General of India, containing the final report upon the operations for measuring an Arc of the Meridian carried through the centre of the Peninsula to the Northern confines of Hindoostan.

3. To ensure the necessary accuracy, the Society would prefer printing the report under the supervision of either Lieut.-Col. Everest, or an Officer of his nomination, and I am accordingly desired to suggest, that Lieut.-Col. Everest may be invited to mention to whom he would wish the proofs to be sent for correction before they are finally printed.

4. Lieut.-Col. Everest's Dispatch will be returned when it is no longer required, accompanied with a few printed copies of the Report, as requested, for the purposes specified.

I have, &c.

The 24th November, 1842.

H. TORRENS.



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